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A NEW VIEW

Zooming user interfaces could change the way we navigate our desktops. Page 92

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Read about our Premier 100 IT Leaders Conference. Pages 1, 24, 28, 32, 36 and 56

CAREERS TO THE MAX

Our Best Places to Work in IT series wraps up with a look at top firms for career development and hot projects. Page 72

COMPUTERWORLD

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JUNE 26, 2000 • VOL. [illegible] • NO. 26 • [illegible]

INACOM LEAVES USERS IN LURCH

Outsourcer goes under, taking help desk with it

BY JULIA KING AND JENNIFER DISABATINO

When Inacom Corp. filed for bankruptcy protection this month, its competitors wasted no time before swooping in to clean up the spoils.

But for one company that had relied on the Atlanta-based outsourcer and reseller, as of last week there was a gaping hole where a help desk used to be.

More than 800 users at Blue Cross/Blue Shield of Michigan were left in the lurch when Inacom pulled the plug on operations. Just two days earlier, Inacom managers had assured Blue Cross/Blue Shield that they had adequate financial backing to meet their payroll and continue providing help desk and in-person support services for at least another two months, said Annette Findlay, division information officer at the Detroit-based health insurer.

Inacom, page 14

INACOM AT A GLANCE

Headquarters: Atlanta

Employees: About 5,000 nationwide

Number of creditors: More than 1,000

1999 revenue: $5.3B

Assets as of June: $956M

Debt as of June: $560.7M

CEO: PARTNERSHIP HURT TOYSMART

Says timing was also a factor in store's demise

BY JULIA KING
PALM DESERT, CALIF.

Bad timing and a poor choice of partners are what ultimately killed Toysmart.com Inc., not so long ago a darling in the crowded and highly competitive online toy market.

"It seemed like we had it all," said Toysmart CEO David Lord, ticking off a list of once-shining assets during a highly emotional keynote presentation at last week's *Computerworld* Premier 100 IT Leaders conference here.

TOYSMART CEO David Lord: "I think timing killed us"

Those assets included an enviable partnership with The Walt Disney Co., the indisputable king of the U.S. family consumer market; a spanking-new 126,000-square-foot fulfillment center; and a top-notch Internet development team that built from scratch a state-of-the-art Web site that was ranked in the top 40 by both Nielsen Corp. and MediaMetrix.

But it still wasn't enough.

Toysmart, page 16

MICROSOFT USERS UNCONVINCED

New C# programming language faces battle with entrenched Java

BY LEE COPELAND

Microsoft Corp. this week plans to unveil a graphical programming language, called C#, that's intended to make it easier for Windows operating systems to interoperate with other platforms through Web services.

But several users said the introduction of the Microsoft development language (pronounced "C sharp") is off key.

Microsoft officials claim that the language

Microsoft's C#, page 117

Promise of .Net Web computing environment will take years to fulfill

BY DOMINIQUE DECKMYN
REDMOND, WASH.

Microsoft Corp. bet its future last week on .Net, its vision of software services that live on the Internet. But initial reactions were skeptical, with users and analysts noting that the core technologies are unproven and that many key components are years from delivery.

Microsoft.Net — previously referred to as Next Generation Windows Services — is a layer

.Net Services, page 117

JAMES D. HERBSLEB and Rebecca Grinter say Bell Labs avoided off-the-shelf collaboration tools because it wanted to be able to enhance the tools over time

GLOBAL TEAMWORK

LIKE OTHER MULTINATIONAL COMPANIES, Lucent Technologies has teams of software developers sprinkled around the globe trying to collaborate on projects. But the distance between sites — in miles, time zones and cultures — often resulted in costly delays, reports Gary H. Anthes. Videoconferencing and packaged groupware didn't help, so Lucent's Bell Laboratories created its own collaboration tools and identified ways to make multisite software development projects work.

Story begins on page 94.

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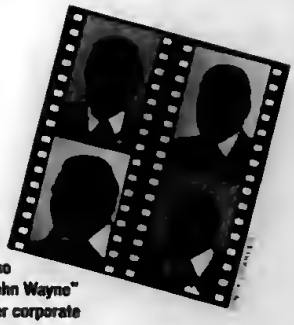
*According to "Internet Security Software: 1999 Worldwide Markets & Trends," by IDC

QUICKSTUDY: CONTINUITY PLANNING

Is your business ready for disaster? In today's 24/7 market, companies like Nasdaq (pictured below) spend a great deal of time on their business continuity plans to make sure they can operate as usual when disaster strikes. Page 76

REAPING REINVENTION AT SCHWAB



Reinvention is the key to growth for Charles Schwab & Co. and for its co-CEO, David Pottruck, who has gradually migrated from a "John Wayne" leadership style to a kinder, gentler corporate persona. Page 66

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10 J. D. EDWARDS promises a version of its ERP suite that will integrate others' software and let users collaborate over the Internet.

12 SUPPLIER REBELLION may be brewing as auto parts makers mull building exchanges to compete with that of the Big Three carmakers.

14 WEATHER.COM SWAPS some Solaris machines for Intel-based Linux boxes from IBM, but most complex pages stay on Sun.

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86 JAVA CREATOR James Gosling says it would be "insane" to turn Java over to a standards body.

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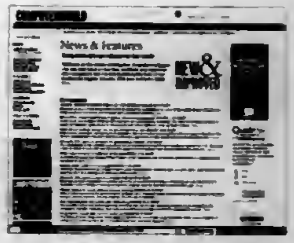

We have redesigned and enriched Computerworld.com, adding, among other things, better site navigation, improved information access and the first of our series of community pages. The first wave — security, e-commerce and Windows 2000 — has been designed to give IT professionals the latest news, research and other data pertinent to their jobs. A forum section in each community enables IT managers to talk directly with their peers about hot issues. This week the site also features online-only coverage of our Premier 100 conference on IT leadership. If you have any comments about the new site, you can e-mail them to **editor@computerworld.com**.

Comments about the community pages can be e-mailed to: **brian_sullivan@computerworld.com**.

OPINIONS

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58 JIM CHAMPY foresees a rough game ahead on the Web, pitting traditional businesses against some IT companies.

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118 FRANK HAYES says data security isn't a priority in corporate America, but IT can — and should — change that.

AT DEADLINE

Lost Hard Drives Found at Los Alamos

Two computer hard drives containing nuclear secrets that disappeared at the Los Alamos National Laboratory in New Mexico reappeared under mysterious circumstances June 16. They were found behind a copy machine in a previously searched ultrasecure area of the facility called X Division.

The incident prompted a full-scale FBI criminal investigation and triggered congressional calls for sweeping security reforms at the laboratory. It's believed that the disks never left the facility and may have been inadvertently misplaced by an employee, said Energy Secretary Bill Richardson in a statement to a Senate committee last Wednesday.

Nike Recovering From Web Site Intrusion

Nike Inc. is gradually regaining control of its Web site after crackers last week seized the sneaker company's domain name and rerouted users to an Australian site with anti-Nike messages. But an undetermined number of users couldn't get through to *www.nike.com* more than 30 hours after the problem was discovered because some Internet service providers, which Nike declined to identify, haven't cleaned up their cached – that is, old – versions of Nike's Web pages.

White House Restricts Cookies on Fed Sites

Now that the federal Office of National Drug Control Policy is stopping the use of so-called Web bugs to track the Internet browsing habits of visitors to its antidrug Web site, privacy advocates want to know what's being done to ensure that people's privacy is protected on all government Web sites.

The Clinton administration is already taking action: in a memorandum sent last week to the heads of all federal executive departments and agencies, Jacob J. Lew, director of the Office of Management and Budget, announced restrictions on the use of Web bugs and other Internet cookies on government Web sites.

Court OKs Third-Party Software Maintenance

Service options increase, but firms are warned to check existing contracts first

BY JAIKUMAR VIJAYAN

A SIX-YEAR legal dispute over mainframe software maintenance issues has ended with a jury verdict affirming the right of third parties to service another vendor's legacy software.

The decision will potentially make it easier for companies to discontinue costly vendor maintenance and seek cheaper third parties to service their aging mainframe software, several users said last week.

But those firms first need to check their existing contracts to ensure that they're not legally bound to vendor maintenance services, the users cautioned.

In a unanimous early-June verdict, a federal court jury in Newark, N.J., said Grace Consulting Inc. in Parsipanny, N.J., didn't violate copyright laws in providing add-on software and maintenance services for customers of Geac Computer Corp. in Toronto.

Dun & Bradstreet Software — which became part of Geac when it was acquired in 1996 — initiated the suit against Grace Consulting in 1995. Dun & Bradstreet claimed that Grace violated its copyright by modifying its mainframe accounting and payroll software for customers while providing third-party maintenance.

Grace claimed that any tweaks it had performed were to make Geac's applications more interoperable with other software at customer locations.

Grace — which offers maintenance services at half Geac's rates — claimed that Geac was illegally using its copyright to prevent customers from hiring less-expensive third parties to maintain its software.

Consumer Support

Grace's victory means more third parties will be encouraged to offer similar services, said Forrest Eudaily, an associate director at Whitehall-Robins Healthcare, a $1.7 billion maker of over-the-counter drugs in Madison, N.J.

"I think it's great. . . . It opens up the market to better competition and better rates," said Joe Quinn, manager of financial and administrative systems at Connecticut Natural Gas Co. in Hartford.

The firm almost signed up with Grace in 1995 because its service was 55% cheaper than what Geac was offering but decided against it because of the lawsuit, he said.

But users need to make sure they're not violating copyrights when making changes to source code under third-party arrangements, warned Eudaily.

Maintaining aging software means having to make occasional changes to the source code, sometimes for regulatory reasons and sometimes to make the software more interoperable with new packaged applications, Eudaily said.

But unless users negotiate the right to make such changes up front, a vendor could prevent them from signing up third-party service providers at a later stage, said Wynn Pope, a director of Chicago-based Share Inc., a large-system user group.

"The best advice would be to simply talk to your vendor" before considering outside service, Pope said.

Users Welcome Tools to Build Voice-Enabled Apps

BY CAROL SLIWA

FindGoodHelp Inc. aims to help consumers secure a handyman's or house painter's services through its Web site. But for the Boca Raton, Fla., company, those workers are often hard to track down.

So FindGoodHelp plans to use new voice technology products introduced by IBM last week to translate consumers' text-based requests into voice messages and forward them to workers in the field — with no human intervention required.

"We don't have to change anything on the back end," said Rajeev Arora, executive vice president at FindGoodHelp. "All we've got to do is change the front end so it now spits out VoiceXML instead of HTML."

The voice-enabled products IBM will ship in late summer and early fall are aimed at providing developers with a common set of tools and middleware to build applications that deliver either text or voice content to a wide range of devices — including PCs and cellular phones.

Key among the offerings is WebSphere Voice Server with ViaVoice speech-recognition technology. Voice Server is the latest extension of IBM's Java-based WebSphere application server suite, which features support for the nascent VoiceXML standard. Pricing will start at $15,000.

"For a while, there was a real boundary between the voice and data world. There needs to be a common development environment and a common clearinghouse of information," said Brian Strachman, an analyst at Newton, Mass.-based Cahners In-Stat Group. There are many voice and middleware offerings on the market, he noted, but "it's just easier to implement if it all comes from one vendor."

Developers typically build one front end for an interactive voice response system that accesses a database via the telephone and another front end for a Web browser that accesses that same database, he said.

T. Rowe Price Investment Technologies Inc., an investment management firm in Owings, Md., uses one database to house the information its customers can access via the telephone or a Web browser. The two channels also share some logic components, but others are separate, said Scott Quartner, a senior systems consultant at the firm. T. Rowe Price must also write different interfaces for its telephone and Web channels, he explained.

Quartner said that "it would definitely be useful" to have common middleware and tools to speed developer training and make it easier to manage the environment.

T. Rowe Price is currently using IBM's ViaVoice speech-recognition technology.

Big Blue Sounds Off

IBM unveiled several new voice technology products, including the following:

WebSphere Voice Server 1.0 with ViaVoice speech recognition technology: Middleware and tools that will help developers build voice applications based on VoiceXML. Has text-to-speech and speech-to-text translation capabilities and a VoiceXML interpreter.

ViaVoice Dictation for Linux: Speech-recognition software for the Linux platform.

Embedded ViaVoice, Multiplatform Edition: A Java-compliant tool kit that lets manufacturers, wireless operators and call phone companies embed speech-recognition technology into mobile devices.

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Judge Kicks Microsoft Case to Supreme Court

But he delays remedies until appeals exhausted

BY MITCH BETTS
WASHINGTON

THE MICROSOFT Corp. antitrust case last week was kicked upstairs, all the way to the U.S. Supreme Court.

And much to the relief of Microsoft, U.S. District Court Judge Thomas Penfield Jackson also put a hold on implementation of his entire June 7 final judgment, including the breakup plan and the interim conduct restrictions that otherwise would have taken effect Sept. 5.

Now the question is whether the Supreme Court will agree to hear the appeal or simply turn around and send it back to the U.S. Court of Appeals.

The next step is an accelerated schedule of briefing meetings in late July and August. Microsoft has until July 26 to lay out its opposition to Jackson's ruling.

The Department of Justice and the states would have until Aug. 15 to reply, followed by another Microsoft response due to be filed by Aug. 22.

If the high court decides to hear the case, it is due to begin its 2000 to 2001 session on the first Monday in October and could make a final ruling by June 2001.

"It's doubtful at best that the Supreme Court will take the immediate appeal," said Hillard Sterling, an attorney at Gordon & Glickson LLC in Chicago. He said the high court typically prefers that the midlevel appeals court clarify the issues beforehand.

The DOJ and 19 states had urged Jackson to approve the highly unusual fast-track appeal to the highest court, arguing that it would speed up resolution of the case, since "an appeal to the Supreme Court is . . . inevitable" anyway.

Jackson consented in a brief order invoking the little-used Expediting Act, which provides for direct Supreme Court review of antitrust cases "of general public importance in the administration of justice."

Microsoft officials said they were "very pleased" that the conduct remedies — which affect its licensing and developer relations — were placed on hold but preferred sending the case to the Court of Appeals, which ruled in favor of the software company in a related matter in 1998.

"This action will allow the appeal to go forward without unnecessary disruption to consumers and the high-tech industry, and we are confident that the final judgment will be reversed on appeal," said Microsoft spokesman Mark Murray.

Conversely, the DOJ was pleased with the move to the Supreme Court but disappointed with the remedies delay. "The sooner a meaningful remedy is in place, the better it will be for consumers and the marketplace," the agency said in a statement.

Microsoft competitors — such as those represented by the Computer & Communications Industry Association (CCIA) here — are also concerned about the delay, because it means Microsoft will be unfettered in its product plans and business practices until all legal appeals are exhausted.

Ed Black, president of the CCIA, said the Supreme Court justices need to act as soon as possible because breaking up Microsoft is "the only effective method of terminating [Microsoft's] illegal behavior" and restoring competition. ▶

Second State Court Dismisses Pricing Suit Against Microsoft

It's two down and 135 to go for Microsoft in class action lawsuits that seek damages for alleged inflated software prices due to its monopoly

Last week, Judge Gene Porter of the Clark County District Court in Las Vegas granted Microsoft's motion to dismiss the Nevada case based on precedent from a 1977 U.S. Supreme Court ruling in a case known as Illinois vs. Brick. In that case, the high court ruled that consumers can't sue a company on pricing issues under antitrust law if the company didn't directly sell them the product in question.

The dismissal was the second state court victory for Microsoft in as many weeks. Last week, a judge in Portland, Ore., cited the same Supreme Court precedent in dismissing a similar pricing suit that was filed in that state.

A Microsoft spokesman last week said the company hopes the decisions in Nevada and Oregon will help Microsoft build momentum against the other class action lawsuits filed against it since last fall. "We believe that [the dismissals] will impact many cases throughout the country," the spokesman said.

But Hillard Sterling, an attorney at Chicago law firm Gordon & Glickson, said he expects "a plethora" of the class action suits to survive Microsoft's dismissal motions.

"Many states have more flexible rules on consumer lawsuits [than Oregon and Nevada do]," Sterling said. As a result, he added, some state courts may permit the class action plaintiffs to press their cases despite the Supreme Court's 1977 ruling.

– Jennifer DiSabatino

Microsoft-Backed Lobbying Groups Claim Security Breaches

Expert says industrial espionage common

BY DOMINIQUE DECKMYN

Responding to published reports last week, Microsoft Corp. said a number of alleged attempts to steal information from lobbying groups associated with it prove "the lengths to which [competitors] are prepared to go to attack Microsoft." But according to one security expert, such security breaches are nothing out of the ordinary.

People sifting through garbage and even impersonating staff or contractors are "common practice" in many industries, said David Remnitz, CEO of security consultancy firm IFsec LLC in New York. "I don't think Microsoft should act surprised about this," said Remnitz. "This occurs in every highly competitive industry." However, he said, charges are rarely pressed because it's hard to find out who has been stealing information.

Last week, Allison Rosen, vice president of public affairs at the Association for Competitive Technology (ACT) in Washington, confirmed a report published in *The Wall Street Journal* that said a company calling itself Upstream Technologies rented space on the same floor as ACT. A person from Upstream on two occasions offered cleaning personnel up to $1,200 in cash for garbage belonging to ACT, said Rosen.

ACT describes its mission as supporting technological innovation "without undue government interference" and counts Microsoft as a member.

Last week, the *Journal* reported that documents and laptops disappeared in a number of incidents at Citizens for a Sound Economy in Washington and The Independent Institute in Oakland, Calif., both of which receive funding from Microsoft.

The *Journal* claimed that documents obtained in this manner were leaked to the press, becoming the source for stories critical of Microsoft's lobbying attempts.

Microsoft spokesman Rick Miller said the information that was leaked to the press didn't affect the company's antitrust trial but was "more an attempt to influence the political arena."

"This latest allegation is particularly troubling and really shows the lengths to which [Microsoft's competitors] are prepared to go to attack Microsoft," Miller said.

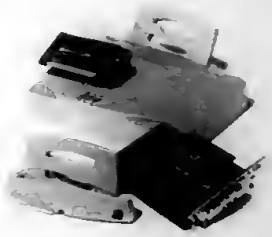
Microsoft competitors contacted by *Computerworld*, including Novell Inc., Sun Microsystems Inc., Oracle Corp. and Netscape Communications Corp., offered no comment on the incidents.

"We're trying not to be too Oliver Stone or John Grisham about this," said Rosen, referring to the creators of popular suspense novels and movies. "[But] our entrance on the Washington scene apparently rattled some cages."

Microsoft's attempts at lobbying Washington via a wide network of advocacy groups have occasionally led to embarrassment. For instance, it was revealed last fall that Microsoft had bankrolled a series of supposedly independent advertisements supporting its case. Other revelations that reached the media included the precise amount of funding Microsoft had provided to some of these lobbying groups. Miller said Microsoft has never attempted to hide the fact that it financed these and other groups — it merely kept the exact amounts confidential.

Microsoft is likely to step up its lobbying efforts even further in the future, according to Miller. But he added that this shouldn't be construed as an attempt to influence the outcome of its legal dispute with the U.S. Department of Justice. "We want to win this case in the courts, not in the political arena," said Miller. ▶

Michael Meehan contributed to this story.



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BRIEFS

Oracle Reverses ASP Decision

Oracle Corp. quietly signed its first application service provider agreement earlier this month, even though CEO Larry Ellison said last year that he would allow third parties to host Oracle applications "over my dead body." Oracle inked an agreement that will allow Agilera.com Inc. in Englewood, Colo., to host its full suite of applications for corporate customers, according to Agilera. Oracle officials declined to confirm or deny whether there is a deal with Agilera.com. Analysts said a half-dozen firms are involved

Handspring IPO Soars

Investors were falling all over themselves to scoop up shares of Mountain View, Calif.-based Handspring Inc. last week, as the maker of a rival to the PalmPilot went public. Raising $200 million, the founders of Handspring - who also created the PalmPilot - saw the value of their firm rise to more than $3 billion on Wall Street after shares started trading.

Texas Instruments Buys Burr-Brown

Texas Instruments Inc. announced that it will buy data converter maker Burr-Brown Corp. in a stock-for-stock deal worth approximately $7.6 billion. Dallas-based Texas Instruments will integrate Tucson, Ariz.-based Burr-Brown's products into its line of analog chips. The deal is expected to close in the third quarter.

Rambus Settles Hitachi Suit

Rambus Inc. has settled its patent dispute with Hitachi Ltd. As part of the agreement, Tokyo-based Hitachi will pay Mountain View, Calif.-based Rambus an undisclosed settlement fee and quarterly royalty payments. Rambus filed its suit in January against Hitachi and Tokyo-based Sega Enterprises, charging the companies with infringing on Rambus' patents for protecting synchronous memory technology and high-performance bus interfaces.

Digital Signatures Law to Speed Online B-to-B Deals

Legislation will cut faxing, snail mail

BY MITCH BETTS

THE HEADLINES about the new "digital signatures" law have highlighted its effect on consumer transactions. But according to experts, it will have a bigger impact on business-to-business e-commerce, including online procurement and electronic marketplaces.

The legislation, which President Clinton was scheduled to sign into law last week, says contracts "signed" by electronic methods are just as legally valid in all 50 states as those signed by hand on paper. The law takes effect Oct. 1.

"The effects on B-to-B will be bigger, quicker," said Brent D. Israelsen, CEO of Orem, Utah-based iLumin Corp., one of several companies with software for creating legally binding e-commerce documents.

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With digital signatures, companies can immediately execute the documents online, without having to send faxes or overnight letters. Software to make that happen comes from companies such as iLumin, which is announcing its Digital Handshake System today, and PureEdge Solutions Inc. in Victoria, British Columbia, which has a product called InterForms that creates legally binding XML documents.

Out in Front

Government agencies are ahead of the private sector in this realm. The Securities and Exchange Commission, under its own regulatory authority, is using the PureEdge software to accept corporate 10K and other regulatory filings via the Web.

Under the law, an electronic signature could be a digital certificate based on public-key encryption, biometric authentication or an e-mail message with "/s/ John Hancock" at the bottom. The definition is deliberately broad and technology-neutral, letting the market decide how much security a particular e-commerce transaction needs, said Thomas F. Crocker, a lawyer at Alston & Bird LLP in Washington.

The law will affect online consumer transactions, too, especially as consumers start to buy big-ticket items online. "Today, consumers can buy airline tickets and groceries on the Internet, but they cannot sign a contract with their financial institution for a mortgage or a car loan," said Edward Yingling, director of government relations at the Washington-based American Bankers Association.

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Michael Hogan, Jersey City, N.J.-based DLJdirect Inc.'s general counsel, said the online stock brokerage is ready to take advantage of the new law, because brokerages won't have to keep written signatures on file if customers opt for purely electronic agreements.

Currently, when a customer opens an account, the brokerage sends a paper form for the customer to sign and return within a month, or else the account is frozen. "What we're doing now is eliminating that step," Hogan said.

Todd Weiss and Maria Trombly contributed to this report.

Sign of the Times

Key developments leading up to the E-Sign legislation:

1980-1996 Some courts rule that electronic documents are legally valid.

1995 Amazon.com begins accepting credit-card payment online for books, effectively using "clickwrap" and e-mail as electronic signatures.

1996 Utah becomes the first state to enact legislation recognizing digital signatures as legally binding. Other states follow with differing legislation.

1996 The Government Paperwork Elimination Act is passed. It requires federal agencies to adopt electronic processes and signatures.

1999 The Uniform Electronic Transaction Act, a model law for states, is passed.

2000 The U.S. Congress passes the Electronic Signatures in Global and National Commerce Act (E-Sign), which sets national guidelines for electronic signatures and contracts.

Microsoft, Others Roll Out Tools to Guard Online Privacy

BY LINDA ROSENCRANCE

Microsoft Corp. and other companies last week unveiled software tools based on an Internet privacy specification proposed by a World Wide Web Consortium (W3C) working group. Those tools, the companies said, should help protect the privacy of online consumers.

Microsoft said support for the Platform for Privacy Preferences (P3P) specification — which offers Web sites a way to communicate their privacy policies in a standard, machine-readable format — will be included with the next major version of its Windows operating system, code-named Whistler, which is due out next year.

A number of smaller software vendors made similar announcements at an event in New York last week, and companies such as America Online Inc., AT&T Corp., Hewlett-Packard Co., IBM and Procter & Gamble Co. said all or parts of their corporate Web sites are being made P3P-compliant.

But the W3C's efforts to protect online privacy, which come as Congress is considering whether to enact privacy legislation or allow firms to regulate themselves, have drawn criticism from others who aren't sure the P3P specification can adequately protect people.

In testimony before the Senate Commerce Committee last week, Marc Rotenberg, executive director of the Electronic Privacy Information Center in Washington, said the privacy research group doesn't think P3P will do enough to promote online privacy.

The W3C's proposed standard "builds on the very weak 'notice-and-choice' approach that is increasingly asking consumers to trade in their privacy for the benefits of electronic commerce," Rotenberg said.

Horst Joepen, CEO of Webwasher.com AG, a German developer of privacy software backed by electronics giant Siemens AG, also criticized the P3P proposal in a telephone interview. People still would run the risk of giving out sensitive personal information such as their names and birth dates, he said.

Piece of the Puzzle

But Lorrie Cranor, chairwoman of the P3P working group and a senior technical staff member at AT&T Labs Research in Florham Park, N.J., said P3P is meant to be only one part of the online privacy puzzle. "Other pieces, like legislation [that would address enforcement issues], are also needed," she said.

The W3C, an international industry group with more than 420 members, said it expects to finalize the P3P specification later this year.

BRIEFS

Oracle Reverses ASP Decision

Oracle Corp. quietly signed its first application service provider agreement earlier this month, even though CEO Larry Ellison said last year that he would allow third parties to host Oracle applications "over my dead body." Oracle inked an agreement that will allow Agilera.com Inc. in Englewood, Colo., to host its full suite of applications for corporate customers, according to Agilera. Oracle officials declined to confirm or deny whether there is a deal with Agilera.com. Analysts said a half-dozen firms are involved.

Handspring IPO Soars

Investors were falling all over themselves to scoop up shares of Mountain View, Calif.-based Handspring Inc. last week, as the maker of a rival to the PalmPilot went public. Raising $200 million, the founders of Handspring – who also created the PalmPilot – saw the value of their firm rise to more than $3 billion on Wall Street after shares started trading.

Texas Instruments Buys Burr-Brown

Texas Instruments Inc. announced that it will buy data converter maker Burr-Brown Corp. in a stock-for-stock deal worth approximately $7.6 billion. Dallas-based Texas Instruments will integrate Tucson, Ariz.-based Burr-Brown's products into its lion of analog chips. The deal is expected to close in the third quarter.

Rambus Settles Hitachi Suit

Rambus Inc. has settled its patent dispute with Hitachi Ltd. As part of the agreement, Tokyo-based Hitachi will pay Mountain View, Calif.-based Rambus an undisclosed settlement fee and quarterly royalty payments. Rambus filed its suit in January against Hitachi and Tokyo-based Sega Enterprises, charging the companies with infringing on Rambus' patents for protecting synchronous memory technology and high-performance bus interfaces.

Digital Signatures Law to Speed Online B-to-B Deals

Legislation will cut faxing, snail mail

BY MITCH BETTS
WASHINGTON

THE HEADLINES about the new "digital signatures" law have highlighted its effect on consumer transactions. But according to experts, it will have a bigger impact on business-to-business e-commerce, including online procurement and electronic marketplaces.

The legislation, which President Clinton was scheduled to sign into law last week, says contracts "signed" by electronic methods are just as legally valid in all 50 states as those signed by hand on paper. The law takes effect Oct. 1.

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SOURCE: PUREEDGE SOLUTIONS INC., VICTORIA, BRITISH COLUMBIA

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Users Hopeful About New OneWorld Software

BY TODD R. WEISS

Some users were cautiously upbeat last week when J. D. Edwards & Co. announced its plan to release a "collaborative commerce" version of its OneWorld business applications in September.

The Denver-based software vendor hopes the upcoming OneWorld Xe (for extended enterprise) suite — which was detailed at the company's annual users' conference in Denver — will help reverse the financial problems that led to an overhaul of its senior management and the layoffs of 800 workers this spring.

J. D. Edwards officials said OneWorld Xe will include built-in capabilities for integrating other vendors' applications and for helping users collaborate with other companies via the Internet.

Barry Paxman, an information technology manager at Cascade Designs Inc. in Seattle who was at the conference, said he was so impressed by OneWorld Xe that he's holding off on a planned upgrade of Cascade's OneWorld-based enterprise resource planning (ERP) system until the new version is ready.

Melting-Pot Capabilities

OneWorld Xe adds e-commerce features that Cascade needs and should be more stable than the OneWorld release now used by the outdoor equipment maker, he said. For example, Paxman said he likes the added support for multiple currencies because his company is preparing to add its Irish plant to the ERP system.

Jamie Wells, IT director at call center software developer Comdial Corp., said OneWorld Xe is important because it offers tighter integration of different applications than J. D. Edwards' current release.

Wells said OneWorld Xe appears to offer Charlottesville, Va.-based Comdial the ability to incorporate all of its existing applications into one seamless system via J. D. Edwards' ActivEra Portal user interface. The only downside, he added, is that the OneWorld Xe upgrade won't be available sooner.

Wells said he hasn't been spooked by J. D. Edwards' financial struggles or the abrupt resignation of CEO Doug Massingill, who was replaced by co-founder and Chairman C. Edward McVaney in April. "I feel pretty confident they're on the right path," Wells said.

Analysts were split, however, on how much OneWorld Xe will help J. D. Edwards stabilize itself. "There's nothing dramatically new in the approach at all," said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Berkeley, Calif.

However, John Bermudez, an analyst at AMR Research Inc. in Boston, said OneWorld Xe's melting-pot capabilities could appeal to users who are trying to integrate ERP and front-office applications.

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Not surprisingly, the people who came up with the idea of selling cars via the Internet came to another group of e-business innovators: the people at Unisys.

We're helping Autobytel.com with everything from **Unisys a-@ction Enterprise Servers** to building Web sites to handle their global expansion. And we'll be there to see the job through. But, then, with Unisys that's always the deal. www.unisys.com

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Auto Suppliers Mull Starting Their Own Online Exchanges

Question costs of joining carmakers in B-to-B venture

BY LEE COPELAND

EVEN AS the Big Three automakers seek federal approval to create an online trade exchange, seven giant suppliers of automobile components want to study the costs and the feasibility of creating separate exchanges of their own.

The suppliers are Dana Corp., Delphi Automotive Systems Corp., Eaton Corp., Motorola Inc., TRW Inc., The Timken Co. and Valeo S.A., whose combined total revenues exceeded $100 billion last year.

Officials of the parts makers said last week that they have commissioned consulting firm Ernst & Young International in New York to identify the technology issues facing the automakers' exchange.

The aim of the study, they said, is to help the parts makers determine the costs of joining the automakers' exchange vs. creating their own online trading systems, which they could use to do business with the automakers or other businesses.

Covisint — the company created to manage the exchange formed in February by DaimlerChrysler AG, Ford Motor Co. and General Motors Corp. — can't begin operation until it receives clearance from the Federal Trade Commission (FTC). Nissan Motor Co. and Renault SA have since joined the exchange.

Covisint must also merge the trading systems the automakers use with its new infrastructure and scale the new systems to handle up to $750 billion per year in transactions.

"When all the dust settles, the big question is, Will [Covisint] take costs out?" said Gary Corrigan, vice president of communications at Dana, a Toledo, Ohio-based maker of piston rings and drive shafts.

"We're working with tight margins and cannot do this just because it's trendy," he added.

The world's largest parts maker, Delphi Automotive in Troy, Mich., has committed to joining Covisint but is also piloting its own supplier portal and evaluating the costs of scrapping its electronic data interchange (EDI) infrastructure, said Rick Radecki, director of e-business at Delphi.

Approximately 40% of Delphi's suppliers use EDI, Radecki noted, and he estimated that the top 10% might be better off sticking with EDI because of the costs of switching to Web-based systems.

Several of the parts makers questioned whether Covisint will force them to abandon their EDI systems and move to Web-based systems for transacting business online. Covisint officials said they don't yet know if that will happen.

Covisint filed antitrust documents with the FTC last week. By law, the agency must respond in 30 days.

Brian Kelley, Ford's president of e-commerce, said he expects the exchange to receive the FTC's approval and be functional by year's end.

Chase Unveils Plan to Offer Banking Portal

First major bank to offer aggregator site

BY MARIA TROMBLY

The Chase Manhattan Bank last week became the first major bank to announce a deal with an account aggregator. Chase said it will offer its customers a one-stop online financial shop in early fall. The banking portal will give customers access to all their financial accounts, regardless of where the accounts are held.

The move marks a radical change in the banking industry's approach to account aggregation. Until now, banks had been opposed to these sites, also known as "screen scrapers," citing security and other concerns.

"Bank of America let the cat out of the bag when it let [its] data be aggregated on Yahoo last summer," said Jaime Punishill, an analyst at Cambridge, Mass.-based Forrester Research Inc.

Now, he said, every bank will have to create its own financial portal. "You watch: In the next 12 months, everybody will do this," he said. "Chase is the first domino to fall."

Chase's banking portal will be operated by a third party, Yodlee.com Inc. in Sunnyvale, Calif. However, it will be branded as a Chase site and will provide services — such as bill payments and other banking transactions — unique to Chase Manhattan.

At least two other banks have already announced plans to offer account aggregation services. Salem Five Cents Savings Bank in Salem, Mass., will bring a Yodlee-powered banking portal online by the end of the year. And Uvalde, Texas-based Claritybank.com, a subsidiary of Purchase, N.Y.-based Clarity Holdings Inc., has struck a deal with CMGI Inc. subsidiary MyWay.com, a developer of portal services in Andover, Mass.

Banks that don't offer portal services will find themselves at a disadvantage when it comes to retaining online customers, said Linda Alt, an analyst at Stamford, Conn.-based Gartner Group Inc.

"I think what you're going to find is that it's going to be a powerful tool to bring the consumer to [the bank's] site on a regular basis," she said.

The biggest obstacle banks face when offering financial portals — and one that isn't shared by third-party services such as those offered by San Francisco-based Intuit Inc. — is the question of privacy.

Third-party aggregators don't have any stake in gaining access to private financial information. But financial institutions might, for example, use data about a customer's other accounts to sell competing services or limit access to information about competitors' products, said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup.

Portal Paths

Third-party banking portals:

PRO:
- Neutrality

CONS:
- Lesser-known brand name
- Limited transaction capabilities

Bank-provided portals:

PROS:
- Established brand name
- Full range of banking services

CONS:
- Potential privacy transgressions
- Possibly limited access to competitors' products

Users Seek Open Storage Management Tools

BY KATHLEEN OHLSON
MONTEREY, CALIF.

Storage company executives at Network Storage 2000 here last week concerned themselves with storage-area network (SAN) standards and the emergence of storage service providers. But they might have been better off talking about how to make their products more manageable when they are brought together under one roof.

Philip Kilburn, a consulting systems engineer at Bank of America Corp. in Concord, Calif., said he doubts that storage vendors will develop a single tool for managing storage infrastructures with products from multiple vendors soon.

"I have 17 data centers across three continents that need to be managed," Kilburn said. "The industry hasn't made any progress [in managing storage products in a heterogeneous environment], and we as customers have to do that ourselves."

At Bank of America, Kilburn trimmed the number of suppliers of tape, disk, fabric, backup and system resource management products to one vendor in each category. For example, the company once used disks from nine vendors but now has only one disk supplier, which Kilburn declined to name.

EMC CEO Michael Ruettgers: Industry making strides toward open products

EMC Corp. CEO Michael Ruettgers said the industry is making strides in developing open storage products. "Companies are growing an enormous amount of data, and they need a set of tools," he said.

Ruettgers noted that EMC has opened the application programming interfaces to its Symmetrix storage system technology and has released ControlCenter, which automatically manages storage. "Over time, there will be more solutions," he said.

Steve Duplessie, an analyst at Enterprise Storage Group Inc. in Milford, Mass., said ControlCenter works with products from other vendors, but customers need to run EMC's Symmetrix.

"Companies are attempting [to develop tools], but for their own products," he said.

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Help Desk Outsourcing Rises

But users need to be convinced of third parties' expertise and empathy

BY JULEKHA DASH

STAFFING challenges and an increasingly mobile workforce are leading more companies to turn to third parties to manage their help desks.

Last week, MyHelpDesk Inc. in Norwood, Mass., launched FirstHelp, a Web-based computer support portal that includes tutorials, a search engine and a hardware and software directory. Other firms, such as Redwood City, Calif.-based Support.com Inc. and Austin, Texas-based Motive Communications Inc., offer products that provide remote diagnostics online.

Ana Volpi, an analyst at Framingham, Mass.-based International Data Corp. (IDC), said automated tools are useful for companies with mobile workers who need technical support at all hours. Moreover, if employees can ask and get answers to basic questions online, that cuts down on the amount of time internal help desk staffers spend on any given call, she said.

The worldwide technical support and help desk outsourcing market is expected to grow from about $2 billion in 1999 to more than $3.5 billion in 2002, according to IDC.

Scott Lane, director of technical services at Rand McNally & Co. in Skokie, Ill., said he's considering using such an automated product to support the company's 1,000 employees. But he probably won't make the investment until 2001, when the products become more mature, he said.

Lane has, however, turned to PC Helps Support Inc. in Bala Cynwyd, Pa., to help manage his company's help desk operations. In April, Rand McNally selected the outsourcer, which provides its own technical support staff to answer questions on any off-the-shelf software applications, such as Microsoft's Office suite. Employees can dial a separate 800 number to speak to one of five Rand McNally technicians about other issues, such as hardware and networking.

Service Levels Improve

Lane said the outsourcing arrangement hasn't reduced his company's internal call volume, but it has improved its service levels. That's because employees typically get answers faster when they call PC Helps. It also gives users more support options, said Lane, whose company will spend about $20,000 on the service this year.

Tony Adams, an analyst at San Jose-based Dataquest, said the challenge of finding and retaining help desk employees is leading more companies to turn to automated products as well as outsourcers. Typically, employees who become proficient in help desk support move on to other work, such as systems integration or a management role. Technical support is a "stressful and underrated position," he said.

But employees often prefer to speak to a "live" person rather than go online to receive technical support, Adams said. In addition, he said, it may be difficult to convince employees that an outside vendor can provide the kind of empathy that users need from support technicians.

Because of these challenges, it's critical to get employee buy-in during the first few months of a help desk outsourcing arrangement, said Adams.

Continued from page 1

Inacom

"Inacom's top management said, 'Don't worry,'" Findlay recalled.

But 48 hours later, Inacom workers were being escorted off the premises, leaving Blue Cross stranded without PC help desk and support services. "It was quite a shock to everyone," said Findlay.

Inacom had been providing services to the health insurer for the past two years, primarily from a help desk center in Tempe, Ariz.

No Contingency

Last week, in-house mainframe and voice communications support teams at Blue Cross picked up some of the work Inacom had been handling, covering all urgent user calls. Less urgent requests, such as jammed printer problems, were put on hold. Findlay said former Inacom employees had been offered temporary employment at Blue Cross.

Findlay said there's a lesson to be learned. "Always, always have a contingency plan. We should have put something in place at the first sign of trouble," she said. "We should have asked ourselves, 'What if they went out of business tomorrow?'" instead of counting on the company lasting even 60 days, she said.

Analyst Bill Martorelli at Hurwitz Group Inc. in Framingham, Mass., said another lesson learned is that companies should avoid outsourcing to just one vendor.

"Sometimes customers might engage with two different suppliers, as a way to potentially keep the other supplier honest," Martorelli said.

MicroAge Inc. in Tempe has assumed full responsibility for the operations it had managed along with Inacom at Wells Fargo & Co. in San Francisco and Arthur Andersen LLP in Chicago, said Michelle Gorel, public relations director at MicroAge.

She noted that MicroAge also took over the Inacom-serviced information technology shop at a pharmaceutical company, where it hired 70 former Inacom technicians. MicroAge also assumed Inacom's functions at an airline and an electric company. Gorel declined to identify the companies, citing nondisclosure agreements.

Meanwhile, Blue Cross/Blue Shield, hasn't given up on outsourcing. Even with Inacom's abrupt departure, "there's no consideration" to bringing in-house support for PCs, servers, software and other services, Findlay said.

"We outsourced in the first place to get service levels up fast and to get skills we didn't have. [PC and software support] is not a core competency," she said. "There's no tendency at this point to bring this back in-house."

Inacom Said To Owe $94M

Compaq Computer Corp. last week claimed that Inacom withheld $94 million in payments made by customers before the reseller and IT support outsourcer filed for bankruptcy protection.

Compaq said Inacom sold the computers but never passed the money back to the manufacturer.

In January, Compaq purchased Inacom's custom configuration unit for $370 million to form a subsidiary, Custom Edge Inc. At the time, analysts said Compaq's acquisition was a move to compete directly with Dell Computer Corp. in Round Rock, Texas.

Custom Edge has withheld approximately $43 million in fees payable to Inacom to partially offset the $94 million loss.

– Jennifer DiSabatino

Weather.com Exchanges Solaris for Linux

Cheap and easy scaling is the main attraction

BY DOMINIQUE DECKMYN

Weather.com is replacing some of its servers from Sun Microsystems Inc. with much cheaper Intel-based machines from IBM running Red Hat Inc.'s Linux.

The reason for the switch is cost, said Mark Ryan, CIO at The Weather Channel Enterprises Inc. in Atlanta. He's moving static Web content to IBM NetFinity 4000 dual-processor rack-mount servers, which he claims will do the same job as the Sun servers for one-third the price.

Linux allows Ryan to add performance in smaller — and cheaper — increments, he said. "We can slot in a new server in less than two hours," Ryan said. Weather.com gets an average of about 300 million page views per month, but it sees peaks of 25 million to 35 million views per day during the hurricane season. In May, the site ranked 26th in Media Metrix Inc.'s list of most-visited Web sites.

For generating dynamic Web pages, such as its personalized home pages, which include maps and news, Weather.com will stick with Sun servers because they perform the task better than Intel machines, Ryan said.

MARK RYAN, Weather.com CIO, says Linux allows him to add performance in smaller increments

The IBM boxes will run the open-source Apache Web server. The Sun servers will be powered by IBM's WebSphere server, which is based on Apache.

"What people like about Linux is you can add [servers] as you need them," said Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston. Linux isn't yet competing with Sun at the high end, but eventually it will, Claybrook said.

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BRIEFS

PaineWebber Tests Cisco IP Product

Mark Katz, vice president of engineering at brokerage company PaineWebber Inc. in New York, said last week that his firm is now testing the viability of Hoot and Holler over IP, a technology from Cisco Systems Inc. in San Jose. The move could save PaineWebber money in dedicated-voice phone-line costs by moving voice traffic from circuit-switched leased lines to the company's existing IP data network.

Internet On Call as Free Access Beckons

Aetna U.S. Healthcare in Blue Bell, Pa., and Hewlett-Packard Co. have teamed up with Westlake Village, Calif.-based NetZero Inc. to provide free Internet access and computer discounts to health care providers, including physicians, dentists, nurses and pharmacists, as well as all medical students in the U.S. The companies will also offer these services to Aetna employees.

British Telecom Claims Hyperlink Patent

British Telecommunications PLC has claimed that it created hyperlink technology, a basic building block of the Web. The London-based phone company said last week that during a routine review of its patents three years ago, it discovered that it owned a U.S. patent covering hyperlink technology. The firm said it will pursue licensing fees for its technology and U.S. Internet service providers will be its first targets.

Short Takes

PLANETRX.COM INC. last week warned that its second-quarter revenue will be about $8 million, less than the $11 million-plus that financial analysts originally expected for the online drugstore. . . . LUCENT TECHNOLOGIES INC. in Murray Hill, N.J., will introduce a new fraud-detection software suite this week. It's designed for use by telecommunications service providers to prevent the unauthorized use of public phone systems by recognizing differences in phone usage patterns.

Continued from page 1

Toysmart

On Friday, May 19, Disney, which last August invested more than $50 million and took a 60% stake in the Waltham, Mass.-based toy retailer, pulled the plug on it all, leaving 200 employees out of jobs. The company's inventory and physical assets, including a fully integrated Web site infrastructure, is on the auction block, and both Lord and CIO John Puckett are visibly and abjectly heartsick.

"Everything we poured our hearts into for the past three and one-half years is gone," Lord said.

The biggest lessons learned, according to both executives, are first, that you must choose your partners wisely, and second, that it's all about timing.

"I think timing killed us," Lord said. "We could have gotten an IPO and have been secure [financially] if timing hadn't killed us." For example, Lord said, Disney and Toysmart — which went online in 1997, after spinning off from The Holt Co., a maker of educational products whose CIO was Lord — agreed to their partnership in May 1999. But it wasn't until August that Disney announced the deal and Toysmart saw any money.

"We couldn't get product because we didn't have the cash yet, and we had to delay our marketing spending, which meant losing our chance to convert customers in the pre-Christmas buying season," Lord said.

Disney officials didn't return calls by press time.

Culture Clash

There also was a major culture clash with Disney, which languished far longer over business decisions and operated much more bureaucratically than its faster and nimbler dot-com partner.

Case in point: It took Disney until January 2000 — after the end of the crucial holiday retail season — to approve the sale of Disney books on Toysmart.com, which was supposed to be its official online bookseller. Disney baby items didn't make it to the Toysmart.com Web site until February, again too late to cash in on the Christmas shopping rush.

It was painful, with incredible highs and lows. But I learned more in the last year than I learned in 10 years in corporate America.

JOHN PUCKETT, FORMER CIO, TOYSMART.COM INC.

"We were on very different timetables. We wanted to make decisions the next day vs. the next month," Lord said.

In late 1999, Disney decided to switch its Internet focus away from toys to leisure and entertainment. That, coupled with Wall Street's steady souring on dot-coms, particularly electronic retailers, made an early 2000 initial public offering (IPO) out of the question.

"Any one of these things might have been easy to overcome, but combine them all and no one can overcome them," Lord said.

Carol Ferrara, an analyst at Gartner Group Inc. in Stamford, Conn., said she expects to see more failed ventures between traditional companies like Disney and their quicker dot-com partners.

Smaller Internet companies "need to carefully consider who they're going to be with," Ferrara said. Big retail companies think a lot differently than pure-play electronic retailers, she noted.

"Traditional retailers are very focused on the bottom line and inventory turns, and we don't see as much of that in the virtual retail space," she said. "A lot of these virtual companies are technologists rather than merchants and lack the understanding of what it takes to succeed in the toy market and in retail generally." Other examples she cited include Boo.com, Violet.com and some of the recently shuttered online pet stores.

Still, Puckett, who came to Toysmart from GTE Internetworking last August, said he wouldn't change a minute.

"It was painful, with incredible highs and lows. But I learned more in the last year than I learned in 10 years in corporate America," Puckett said.

Five weeks after Disney pulled the plug, more than 90% of Toysmart's 200 employees have new jobs, many at other dot-coms.

"The first day [after the shutdown announcement], we had 250 companies call and try to hire our employees," Lord said. "We've had calls from companies wanting our entire systems department."

In fact, Lord said, about 75% of Toysmart's Web team went to Core Change Inc., a Boston-based Internet services firm.

Lord and Puckett have also had hundreds of telephone calls from potential employers. Neither has decided what to do.

But there's one place you probably won't find Lord.

"I don't think I'll stay in the toy business," he said. "I don't think I'm that much of a glutton for punishment."

Toysrus.com Hires Four Execs, Including IT Chief

Group brings 70+ years of experience

BY CAROL SLIWA

Continuing with its long-term expansion plans, Toysrus.com last week announced the recent hiring of new executives to help beef up its information technology infrastructure, customer service and fulfillment operations.

The Woodcliff Lake, N.J.-based online retailer's new senior managers collectively bring more than 70 years of related experience from established businesses such as The Gap Inc., American Express Corp., Reebok International Ltd. and Calvin Klein Inc.

"Now, we're very fortunate in the fact that the way the marketplace is changing today, we can offer people a very interesting opportunity — because of the brand name, because of the opportunity we've got — and at the same time, they get a chance to get some pre-IPO stock," Toysrus.com CEO John Barbour said during a recent interview.

The new hires at Toysrus.com are the following:

- Jim Brownell, vice president of IT, who will be charged with managing IT for Toysrus.com's expanding distribution and fulfillment network. Brownell has spent the past 19 years at The Gap in San Francisco.
- Michael Blancone, who will serve as chief logistics officer, brings almost 30 years of experience managing high-volume distribution functions at companies such as Calvin Klein and Amex, both based in New York, and Stoughton, Mass.-based Reebok.
- David Braxton, vice president of customer service, brings seven years of experience from Amex.
- Ray Arthur, who will take over as vice president of finance and administration, brings nearly 20 years of experience from Paramus, N.J.-based Toys R Us Inc. and General Signal Corp.

During the past holiday season, Toysrus.com suffered highly publicized difficulties when it was unable to fulfill some customer orders in time for Christmas. The retailer has been taking steps to beef up operations ever since.

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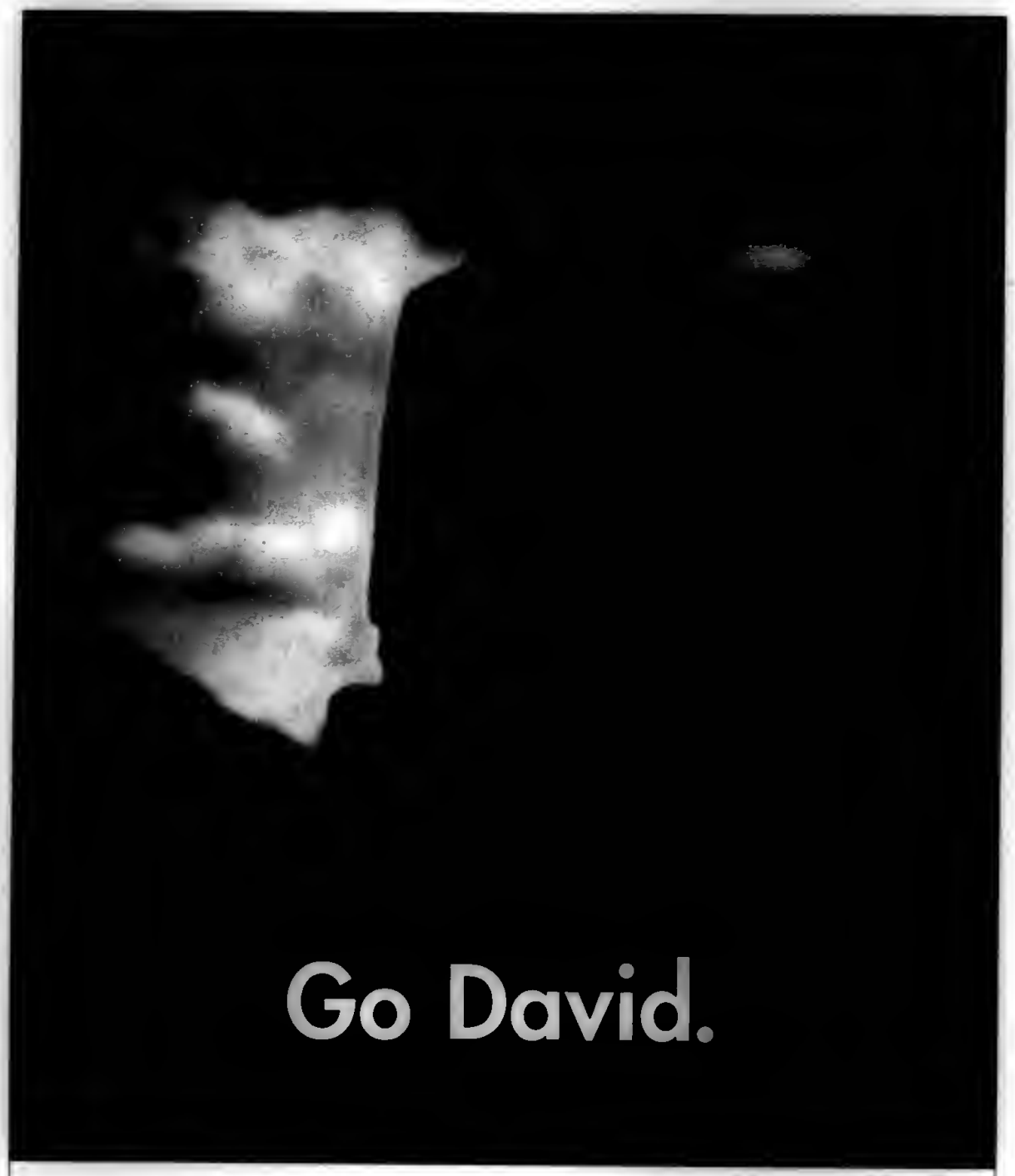

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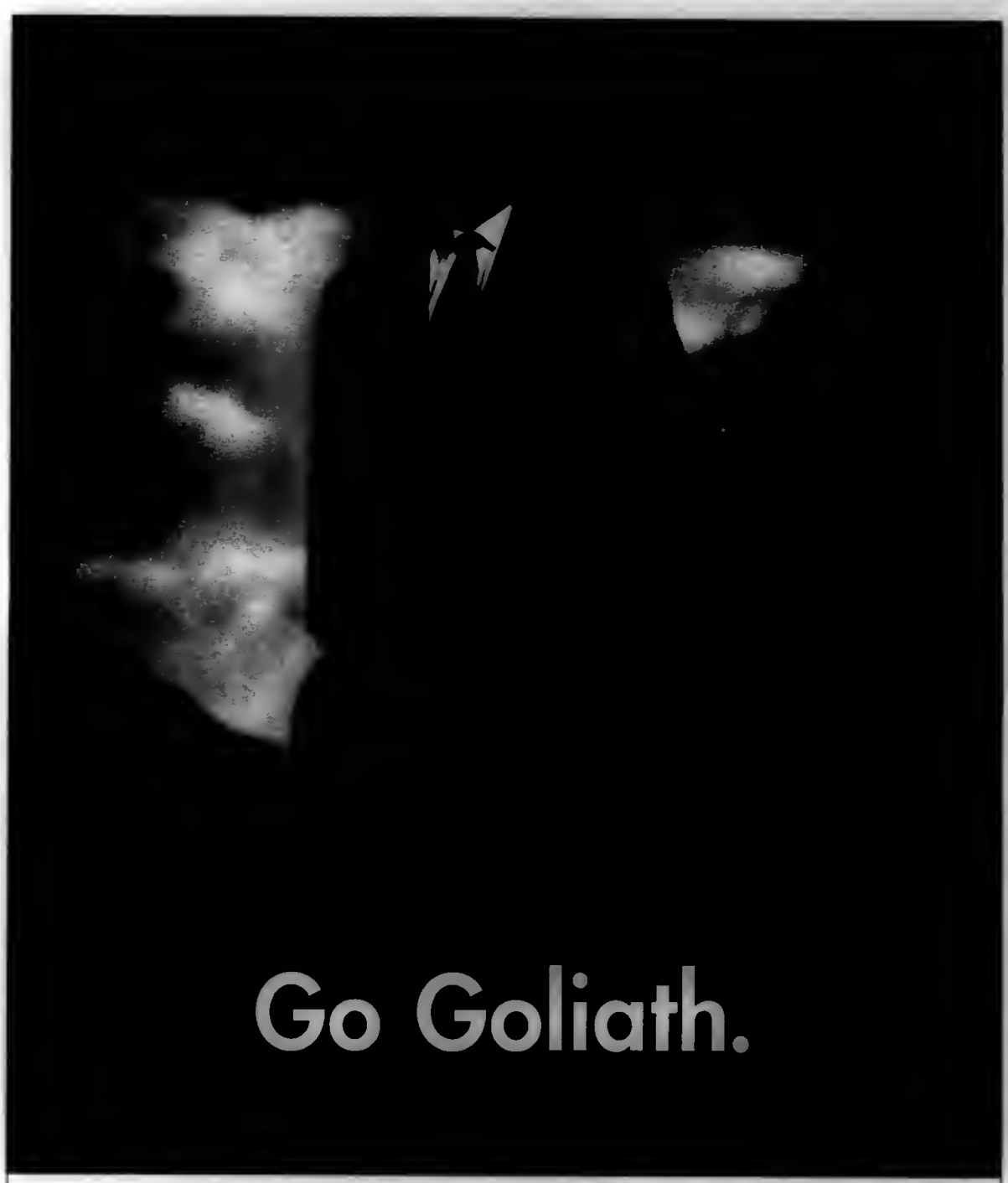

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AOL Investigates Theft of Account Data

200 member accounts compromised after employees open infected attachments

BY ANN HARRISON

CUSTOMER SERVICE representatives at the world's largest consumer online service apparently failed to heed a computer security warning impressed upon the public in recent months: Don't open suspicious e-mail attachments.

America Online Inc. acknowledged last week that 200 member accounts were compromised when targeted AOL employees opened infected e-mail attachments. The attachments unleashed a Trojan horse program that created a connection to the employees' machines, allowing intruders to access password and credit-card information.

Observers.net, a site frequented by current and former AOL employees who first reported the security breach, asserts that the exploit has given crackers root access to AOL's Unix servers, allowing them to create back doors to customer data. The site claims the hole could be used to steal thousands of credit-card numbers.

AOL spokesman Rich D'Amato, who said the company is investigating the incident, expressed frustration that employees have failed to shield AOL's 23 million customers from security breaches.

"We spend a great deal of time messaging our employees and our members that they need to take care in not downloading attachments that come from senders unexpectedly," said D'Amato.

Some outside security experts said lax control over company desktops also helped intruders gain entry into AOL's internal network. Crackers targeted AOL employees with access to the company's Customer Records Information System (CRIS) to open the gate. CRIS is the user interface to the main AOL database that contains customer information, credit-card data and passwords.

Because the AOL servers believe the intruder is dialing in from "On Campus," they don't trigger a security setting called SecurID preferences, which is often set to "Challenge Off Campus Only." This allows an intruder to sign on without the use of a SecurID key. D'Amato confirmed that AOL is resetting all internal SecurID preferences to "Challenge Always."

"Obviously AOL needs to do a better job at securing their desktops and not allow certain applications such as e-mail to be run from the same desktops that people use to connect to internal systems," said Elias Levy, chief technology officer at San Mateo, Calif.-based SecurityFocus.com. "It shows that your firewall is not going to be a solution that stops all security problems."

In an account that D'Amato didn't dispute, Observers.net described how the Trojan horse used a TCP-redirect program capable of defeating firewalls that block incoming Transmission Control Protocol (TCP) connections. When the Trojan horse is triggered by an AOL employee with access to the internal network, the software acts like a client and attempts to connect to the company's servers. The TCP-redirect program makes the AOL servers believe the intruder is on the internal network.

"You edit your tcp.cel file to connect to localhost," explained an Observer.net participant going by the name "Retired," who said TCP packets are then sent from the invading computer to the infected computer. The infected computer opens a connection to America Online and acts as an intermediary, allowing CRIS access.

Retired said CRIS can be accessed by having the tcp.cel file connect to a cable modem, which can't be traced to the attacker's computer. The cable modem then relays commands to the Trojan on the AOL employee's workstation.

Analysts: Better to Be Safe Than Sorry With Viruses

BY JAIKUMAR VIJAYAN

Despite the occasional false alarm, it's still better to be safe than sorry when it comes to responding to virus threats.

That's the advice users and analysts have in the wake of reports that the Serbian Badman virus wasn't nearly as deadly as had first been feared.

The Serbian Badman scare was triggered June 8 by Network Securities Inc. (Netsec), a Herndon, Va.-based security firm. The company claimed that the Trojan horse, disguised as a video clip, could be used by crackers to launch distributed denial-of-service attacks similar to the ones that crippled several major Web sites earlier this year.

Trojan programs basically allow crackers to remotely control infected systems.

Netsec — which rushed to the FBI with news of its discovery — claimed that it had unearthed at least 2,000 servers worldwide that had already been infected.

The scare ended almost as quickly as it began, though, with security experts dismissing the virus as a mostly harmless version of a much older and well-known Trojan horse. Security sites such as the FBI's National Infrastructure Protection Center and Pittsburgh-based Carnegie Mellon University's Computer Emergency Response Team didn't even issue their usual alerts.

The incident illustrates how publicity surrounding virus attacks sometimes causes a false alarm. But administrators still need to treat reports seriously, users and analysts said.

"There is no silver bullet associated with this," said Harry DeMaio, president of Deloitte & Touche Security Services LLC in Deerfield, Ill. "Firewalls, protective structures and intrusion-detection technologies all help but don't absolutely guarantee that a specific attack will not take place."

So the only option for users is to make sure they aren't compromised each time a new warning comes out, he said.

Users need to take every threat seriously, said Josh Turiel, a network services manager at Holyoke Mutual Insurance Co. in Salem, Mass.

"There are some real, honest-to-goodness threats out there," Turiel said. "So if anything, all this hype is at least making us feel a little more paranoid about our security."

Path of Destruction

Viruses are spreading faster, infecting more systems and causing more costly damages.

Jerusalem, Cascade, Form	1990	Executable file, boot sector	Three years	$50M for all viruses over five years
Concept	1995	Word macro	Four months	$50M
Melissa	1999	E-mail-enabled, Word macro	Four days	$93M to $385M
I Love You	2000	E-mail-enabled Visual Basic script	Five hours	$700M

Joke Virus Spreads Fast, Clogs Servers

BY JAIKUMAR VIJAYAN

An e-mail virus disguised as a text file attachment spread widely across the Internet last week.

The worm — which arrives as a joke about the stages of male and female life and comes with many subject headers, including "Funny" and "Life-Stages" — could cause e-mail servers to become clogged because of its ability to quickly copy itself to others via Microsoft Corp.'s Outlook e-mail client once it's launched, antivirus experts warned.

But initial research shows that the worm, called Life-Stages.txt.shs, doesn't damage any files or corrupt data, antivirus experts said.

"It is similar to the love letter [virus] in the way it sends itself out to everyone in your e-mail address book," said Patrick Martin, a product manager at antivirus software vendor Symantec Corp. in Cupertino, Calif., referring to the recent "I Love You" bug.

"The real risk this one poses is e-mail flooding," Martin said. In an assessment of the worm posted on its Web site, Symantec described damage from the worm as low, its distribution in the wild as high and the ability of systems administrators to contain the bug as relatively good.

"This one is relatively benign in that its main focus is to send itself to other people," said Piers McMahon, a business manager at Computer Associates International Inc. in Islandia, N.Y. "But at the same time, it can quickly clog up corporate networks with useless e-mail if it is allowed to propagate."

Pittsburgh-based Carnegie Mellon University's Computer Emergency Response Team (CERT), which posted an alert on the worm, claimed that it had reports of individual users receiving as many as 30 copies of the bug. Some large sites reported as many as 120,000 copies passing through a single server, CERT said.

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SOURCE: ICSA.NET

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— *Craig Bell, Vice President, Metadata Resource Management, Bank Of America*

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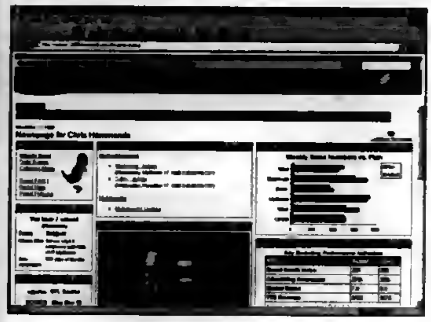

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Panel: Steer Clear of ASPs for Mission-Critical Applications

But ASPs may be a good choice when quickly implementing routine tools

BY JAMES COPE
PALM DESERT, CALIF.

ALTHOUGH renting business applications from an application service provider (ASP) rather than installing the software internally may make sense for users in the short term, a panel of four experts at the *Computerworld* Premier 100 IT Leaders Conference here last week generally agreed that large companies should watch their backs when they turn things over to one company.

Before you sign an application hosting agreement with an ASP, "check it out like a company you're going to buy," said panelist John Voeller, senior vice president and chief technology officer at Black & Veatch in Kansas City, Mo. One company Voeller is familiar with stored 200,000 drawings worth $10 million on systems hosted by an ASP, he said, but the hosting firm lost the data, and it took months to recover the information.

Examine Personnel

Besides looking at the financial stability of an ASP, Voeller recommended talking to the system and network administrators who will be responsible for day-to-day operations of the rented technology infrastructure. They really have to know what they're doing, Voeller said, adding that he "can count the number of ASPs on one hand that have top network people on staff."

GALILEO INTERNATIONAL'S James Lubinski says ASPs can help speed some processes

Sateesh Lele, president of Lele Consulting Group in New York and a former CIO at Avon Products Inc. and General Motors Corp.'s European operations, agreed. "You should do some due diligence," Lele said. "You have to wonder about ASPs that say, 'We'll probably make money in 2002.' "

Mark Mathias, president of EurekaDigital Inc. in Burbank, Calif., and another panel member, said ASPs may be fine for handling routine functions such as 401(k) retirement programs.

But, he said, he's skeptical about the idea of turning over custom-built applications that are specific to a company's business processes. That, Mathias said, could make it harder to maintain "a sustainable playing advantage" over rival companies.

A Place for ASPs

Nonetheless, James Lubinski, executive vice president at Galileo International Inc. in Denver, said there's definitely a place for ASPs. Relying on a hosting firm can help companies speed the process of migrating from legacy systems to new applications, according to Lubinski.

The ASP approach circumvents a lot of company politics while providing instant access to more information technology resources. The lack of quality IT workers that corporate users are facing is what's really driving the ASP marketplace, Lubinski said.

The panelists concurred that although ASPs may be an appropriate option for quickly implementing routine applications, they're generally not a good choice for mission-critical applications. The risks are too high, and outsourcing custom-developed applications can be more expensive than running them in-house, panelists said.

MORE ONLINE

For complete coverage of the Premier 100 IT Leaders Conference, visit our Web site. www.computerworld.com/premier100

Experts Warn of Challenges in B-to-B

Among them: New types of partners

BY THOMAS HOFFMAN
PALM DESERT, CALIF.

A raft of challenges await information technology leaders who seek to take advantage of business-to-business e-commerce and electronic marketplaces, said a panel of CIOs speaking on the topic at *Computerworld*'s Premier 100 IT Leadership Conference here last week.

For one thing, much of the emerging technology used to support digital relationships among business partners and customers "is unstable," said Bruce Carver, vice president of information management and technology at The Reynolds & Reynolds Co., a Dayton, Ohio-based IT provider for the automotive industry.

MATSUSHITA'S Schwartz: Industry has moved to 'co-opetition'

As far as the technology used to support e-commerce initiatives, "if you look under the covers at the technology [they're] using, what's under the covers is not something you want to sleep with," Carver said.

On the business side, creating electronic marketplaces can require working through a decades-old mentality of fending off bitter rivals to work together to achieve common objectives, such as generating the kind of liquidity needed to make an electronic marketplace succeed.

"When we looked at [business-to-consumer e-commerce], there wasn't much interest by senior management to sell competitive products on our site," said Robert Schwartz, vice president and CIO at Matsushita Electric Corporation of America (Panasonic). But in the electronics industry, said Schwartz, "there's a lot of cross-selling. Sometimes we're competitors, and sometimes we're suppliers to each other. That's really where the industry has moved to — to 'co-opetition.' "

CIOs have also quickly discovered that in electronic marketplaces, "neutrality is the key" to gaining acceptance by suppliers and customers, said John Keast, CIO and chief technology officer at NetworkOil Inc., a Houston-based global Internet exchange for oil services and equipment.

Kathy Brittain-White learned that lesson the hard way. Brittain-White, who is CIO at $26 billion Cardinal Health Inc., told fellow IT leaders at the conference about how her company tried — and failed — to convince competitors such as McKesson Corp., analysts and customers that Cardinal.com could act as a neutral site for buying and selling health care products. Instead, Cardinal is now in discussions about creating an exchange that would be run by a neutral third party.

Peter Burrows, chief technology officer at Reebok International Ltd. in Stoughton, Mass., said manufacturers such as his company "have to decide whether to partner with an e-tailer or a brick-and-mortar retailer" or spend millions of dollars to create an online shopping site "and compete with your [distribution] customers."

"The question is, do you lead or follow [in e-commerce]?" Schwartz said.

MORE THIS ISSUE

For more stories from the Premier 100 IT Leaders Conference, see pages 1, 28, 32, 36 and 56.

Palm Nears Release of Link to Notes

BY MATT HAMBLEN
PALM DESERT, CALIF.

Palm Inc. officials said last week that they still plan to target handheld computers and related applications at enterprise users, as announced last fall. Some 80% of the 7 million devices in circulation are used in the workplace.

Applications on the Way

Two-thirds of the 78,000 application developers registered with Palm are building enterprise applications, Chuck Yort, vice president of marketing at the Santa Clara, Calif.-based company said during a speech at *Computerworld*'s Premier 100 conference.

One Palm customer, City Utilities of Springfield in Missouri, has ordered 30 Palm IIIxe devices for a pilot project in which upper-level business managers will use the handhelds to access e-mail and calendar applications, said Kelly Laurie, the information technology director at City Utilities.

Laurie said he has had only two complaints thus far: The devices are so popular he can't get his order filled quickly enough, and Palm is still working on software that's supposed to give handheld users a direct link to Lotus Notes e-mail servers via a cable attachment.

Yort said the direct conduit to Notes is scheduled to become available in three months.

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IT Leader Calls for Education, Diversity

BY KATHLEEN MELYMUKA
PALM DESERT, CALIF.

CAMBRIDGE Technology Partners Inc.'s **Thornton May**, corporate futurist and vice president of research and education at the Cambridge, Mass.-based company, delivered an animated and irreverent talk last week on innovation and change to an audience of 400 information technology leaders here at *Computerworld*'s Premier 100 IT Leaders Conference. Afterward, he elaborated on some of his themes.

Q: Lets talk some more about innovation and change.

A: What's really nice about this new economy is that we're actually changing as a species. We used to be more deterministic. We'd say, 'I can only do what Ford Motor Co. does. I'm constrained by my organization.' But right now, the true organizational entity is the human being, the human soul, the human intellect.

Q: Hot skills are changing so fast. How will people deal with that?

A: While we'll have an 'always-on' economy, you're not going to have an 'always-on' career. The perishability of skill sets has never been greater. You get the hot skills, and as those skills cool off, those people will either go off and train themselves or you'll train them. You get a 30% productivity drop while they reposition for the next step.

Q: And what do companies do about this?

A: Companies are not going to expose themselves to the shelf-life effect. My job is going to be a world-class broker. I'm going to make sure I know which skills I need and that I can access them.

And in the future, people are going to be playing a greater role in creating the raw material that they use. So you've got things like the University of Toyota in Torrance, Calif., and you're seeing much greater use of customized programs in executive education.

Q: So in this scenario, people must have fallow time to learn?

A: Yes. And that's what's wrong with some of the dot-coms: They don't have any slack resources, and it's unsustainable to run these people 18 hours a day, because they'll burn out. That's why you have to reconceptualize: You've got this team coming in, and you tell the other team, 'You guys go rest; stop; read.'

THORNTON MAY: Information technology is really business technology

Q: That's something you were really stressing: that people need to recharge.

A: Yes. Step back; talk to other people. Diversity is a real source of creativity.

Q: How about the role of the CIO. Is that going away?

A: No, but it's become so big that it's being relabeled into multiple parts. You've got the chief technology officer who has to put in place an architecture that will scale and that's not toxic to new technology, because every 18 weeks — not months, *weeks* — we've got a new game.

Then you've got to have a chief tech operations officer who makes sure that the stuff you've got works. You can't do all that with one person. It's a world for multiple heroes with multiple skills.

Q: How about the IT function itself?

A: It's not information technology; it's business technology. There is no such thing as an IT project; there are business objectives that have IT components to them. It's all coming together. What's really great is, IT won!

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BRIEFS

Heavyweights Invest In Streaming Media

Digital Island Inc. has partnered with Compaq Computer Corp., Intel Corp. and Microsoft Corp. to expand its streaming media network by 8,000 servers over the next two years. The three companies will invest $45 million to enhance San Francisco-based Digital Island's infrastructure, using Compaq servers with Intel chips. Investment details weren't disclosed, but Compaq will add $50 million to finance leasing of the new hardware.

Corel Outlook Bleak

Ailing Canadian software company Corel Corp. last week reported its financial results for the three-month period ended May 31, confirming a net loss of $23.6 million on revenue of $36.6 million. Corel said it expects the next quarter's results to be similar. The firm is finalizing a cost restructuring plan designed to save $40 million. Officials emphasized the need to "secure additional equity or debt financing immediately and to effect a significant cost reduction plan in the near future."

Short Takes

Struggling Washington-based data analysis software vendor MICROSTRATEGY INC. last week said it has received $125 million in new financing. . . . Netherlands-based PHILIPS SEMICONDUCTORS announced an agreement to acquire IBM's MICrus Semiconductor operation. The U.S. plant produces up to 250,000 8-in. wafers per year. . . . INTEL will take a charge of about $200 million in its second financial quarter to cover the remaining costs of a program to replace faulty motherboards. . . . Tokyo-based HITACHI LTD. and IBM are set to begin negotiations to form a strategic alliance that would see the competitors collaborate in the areas of development, manufacturing and purchasing. . . . ORACLE CORP. announced strong results for its fiscal 2000 fourth quarter, which ended May 31. Compared with last year's fourth quarter, net income increased 76% to $928 million, and revenue grew from $2.9 billion to $3.4 billion. Application software sales increased 61%, while database sales increased 12% and consulting and support revenue grew 7%.

Cisco's CIO Discusses Changes, Challenges

Says company remains focused on managing growth, customer satisfaction

COMPUTERWORLD 100 PREMIER IT LEADERS

COMPANIES THAT want an e-commerce presence won't succeed by plastering a thin Web veneer onto an existing brick-and-mortar infrastructure. To be successful in the Internet economy, every department must have an electronic-business strategy, measurable to best-of-class benchmarks

That was the message delivered by Cisco Systems Inc Vice President and CIO **Peter Solvik** in his keynote address last week at *Computerworld*'s Premier 100 IT Leaders Conference in Palm Springs, Calif

But although information technology managers at the conference heard Solvik's message about the Internet economy, they didn't learn a lot about Solvik the CIO. So *Computerworld* senior writer James Cope caught up with Solvik after his speech to find out what it's like to be the top IT manager at the San Jose-based company.

Q: Describe your workweek.

A: A typical week for me? Well, every other week I do a presentation, much like the one I did here today. I usually have three customer meetings a week, mostly with senior executives — CIOs, CEOs. I meet with a couple of start-ups to look at new technologies. I also get involved in recruitment.

Q: How do you balance work and your personal life?

A: I have a pretty reasonable balance. But you have to make that happen. I've lived in Silicon Valley for about 20 years. You learn to get things done in short amounts of time. You are what your team is. I have an exceptional leadership team.

Q: How many people report directly to you?

A: I have eight line-direct reports and three or four staff-direct reports We generally have a pretty high reporting ratio. It's about 10 tn 1. That way, we don't get too hierarchical.

Q: What are your biggest challenges – the things you worry about?

A: We're a very paranoid company We spend a lot of time worrying about what we don't know . focusing on competitors We're always looking at customer satisfaction.

Q: Who are your major competitors?

A: Nortel, Lucent, some others overseas. And of course start-ups.

Q: What about operations? What are your concerns there?

A: Scaling the company is a very big focus. We've beeo growing at 50% a year. Not many companies this large grow that fast. We're constantly working on how to scale without hitting the wall or going off the track.

Q: Seldom does a week go by in which Cisco doesn't acquire another company. How do you bring a new company into the fold?

CIO PETER SOLVIK says the Internet economy is young but evolving

A: We have a repeatable process for doing acquisition integration. The way those companies become part of Cisco is through connectivity. They hook into our systems and become part of our culture in a natural way.

Q: When will the idea of e-commerce become business as usual?

A: That's evolving now. It'll be a five- to 10-year transition. The Internet economy is still very young.

CA Adds ARCserve Features

Antivirus, serverless backup included

BY KATHLEEN OHLSON

Computer Associates International Inc. last week unveiled a new version of its ARCserve data protection software that for the first time includes antivirus features and allows for serverless backup.

CA's InnoculateIT antivirus eogine, which searches for and eliminates viruses, has been added to ARCserve 2000, said Peter Malcolm, senior vice president of storage management business at the Islandia, N.Y.-based company. Serverless backup is accomplished as data is copied from disks to tapes, bypassing the server, Malcolm explained.

John Webster, an analyst at Illuminata Inc. in Nashua, N.H., said serverless backup will ease users' storage managemeot burdens.

"[It] streamlines backup and restoration operations, basically saving users time," Webster said.

Chris Corp, director of information technology at Kansas City, Mo.-based Houlihan's Restaurant Group, said ARCserve 2000 will allow mission-critical applications, such as inventory aod accounting, to be backed up several times per day without affecting server performance.

ARCserve 2000 supports the Active Directory and COM+ database protection features in Windows 2000. It also supports active clustering, which enables data protectioo to continue even if a server failure occurs.

"Just about every new SAN, backup and storage management product promised [for being released] by everybody will support Windows 2000," Webster said.

Pricing for ARCserve 2000, which will be released July 1, will start at $695.

Compaq Ports Linux to IPaq

BY BOB BREWIN

Compaq Computer Corp. last week said it has ported Linux to its iPaq bandheld computer so open-source software developers can start working on poteotial applications for the device.

IPaq is curreotly based on Microsoft Corp.'s Pocket PC technology and the Windows CE operating system.

The Linux-based iPaq isn't being made availahle to end users at this point, and Compaq didn't disclose any plans to release a commercial version. But application developers can download the source code for the Linux port from a new Web site (*www.handhelds.org*) focused on open-source handbeld development that the Houston-based computer maker is hosting.

Compaq said the Linux port and the Web site are aimed at enabling "developers and researchers [who are] looking to explore applications and uses for handheld computing to experiment with" the iPaq device.

Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., said using open-source Linux "could lead to a lower-cost device" because Compaq wouldn't have to pay royalties to Microsoft as it does for Windows CE.

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MARYFRAN JOHNSON

Sharing the pain

CEO DAVID LORD STOOD on our conference stage last week, all 6 feet 7 inches of him projecting the still-aching heartbreak of Toysmart.com's sudden death only one month ago. By the time the 35-year-old executive wrapped up the story about the failure of the highly lauded dot-com (see this week's News section), there wasn't a dry eye in the room at *Computerworld*'s Premier 100 IT Leaders Conference.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

"I wanted to run up there and give him a hug," one CIO said afterward. "I could feel everything the guy went through."

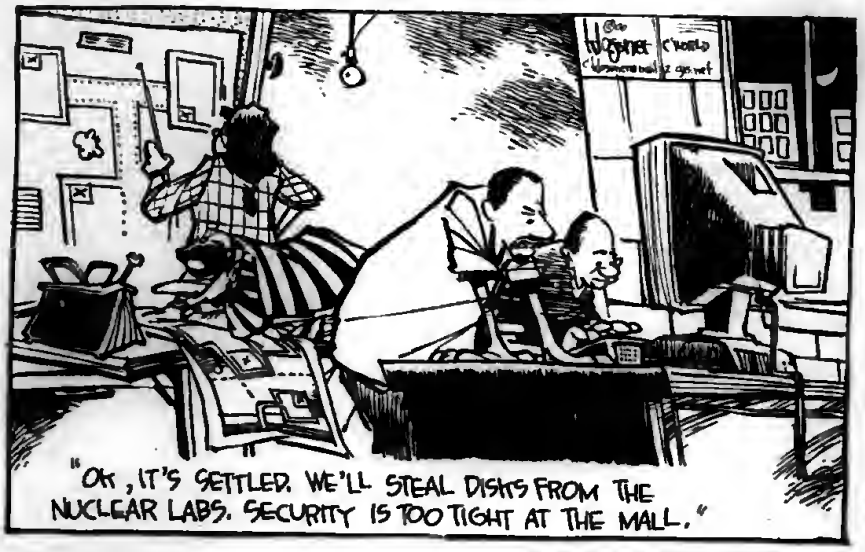
A fatally flawed partnership with Walt Disney took only nine months to doom an online business that had everything going for it. Toysmart's e-commerce infrastructure was state-of-the-art. Its 270 employees were passionately attentive to customers, and the site reflected the company's overall quality.

So what were Toysmart's biggest mistakes? Picking the wrong partner, and bobbling itself in the race against time. A nimble, small company tied its fate to a slow-moving, hierarchical behemoth. Decisions that once took a day to make now took a month or more. Disney's Internet strategy was in a confused state of flux, and Toysmart was left out of the loop. With too little revenue and too few customers, the tiny retailer was outgunned in its own competitive market. So an impatient corporate parent shot it down.

Within 24 hours, 700 customers had e-mailed Lord to pour out their sympathy. "Toysmart set a shining example of what e-business should be," one customer wrote. "I feel like my dog died," another lamented. Watching the Lord of the Toys on stage last week, we knew how they felt.

Here was an e-business doing all the right stuff: building value and caring about customers. It wasn't just another bunch of opportunists playing Millionaire IPO Poker. No wonder 90% of the Toysmarters have already found new jobs.

What hit home with listeners was Lord's raw honesty about Toysmart's missteps. In a culture that celebrates success to excess, it's rare to find someone brave enough to talk about failure, let alone generous enough to share the painful lessons learned. We thank you for that, David, and wish you the best.



DON TAPSCOTT

Harnessing 'human capital' over the Web

AMAZON.COM is an Internet juggernaut because it leverages the human capital of far more people than just its employees. Yes, the company has good management, Web site designers, administration and distribution staff. But Amazon's human capital extends well beyond the company to include the following:

- Countless authors and readers who generate online book commentaries and chats.
- Publishers that provide sophisticated content for the Amazon.com Web site.
- The tens of thousands of individuals and companies that have hot links to Amazon.com on their Web sites.
- Staff at *Kirkus Reviews*, *The Library Journal* and countless other book review publications.

DON TAPSCOTT is chairman of Digital 4Sight (www.digital4sight.com) and co-author of *Digital Capital* (Harvard Business School Press). Contact him at dtapscott@digital_4sight.com.

Amazon has built an extraordinary business web — a group of producers, vendors, service providers and customers working together via the Internet to create value. This "b-web" internetworks the human capital that's essential for the online bookseller's success, yet its constituents are beyond its ownership or control.

Internetworked human capital raises challenges and opportunities for all businesses. The human resource now extends beyond the firm; people resemble molecules moving across the firm's porous membrane in ever-changing configurations. Companies need internetworked human resource management, and managers should define and communicate an explicit b-web culture to guide the deployment of human capital.

Of course, the best way to obtain this is through the Internet itself.

Steven Behm, Cisco's former vice president of global alliances, said, "We have 32,000 employees, but only 17,000 of them work at Cisco." The company works with a human resource that extends far beyond its corporate boundaries. It treats its b-web as the central actor in value creation. It doesn't outsource functions; it integrates partners. For example, Cisco's human capital includes microchip designers in teams that include, but don't primarily comprise, Cisco employees.

Sun Microsystems CEO Scott McNealy constantly presents his company as the defender of open systems, in contrast with what he views as a

closed, autocratic Microsoft. Sun champions the value of customer power, vendor independence and free enterprise, and it frees its knowledge workers to create ideas and technologies such as Java. McNealy communicates corporate values regularly through vehicles like Sun Talk Radio.

In the past, companies controlled their own cultures. Today, it isn't so easy. Your employees may use another company's Web communication system for large parts of their day, becoming immersed in someone else's culture. For instance, some workers at electronics manufacturing services provider Solectron spend many hours on the Hewlett-Packard extranet, helping HP add value for its customers.

An information technology infrastructure is now the most potent tool available for shaping a corporate culture. And managers will increasingly look to IT to help them extend the culture beyond the corporate walls.

DAVID MOSCHELLA

IT professionals can help ease economic change

BECAUSE LARGE MERGERS and acquisitions make for good news copy and easy armchair analysis, they tend to attract a disproportionate share of media and market attention.

Perhaps this explains why so many of us seem to believe that industry consolidation is the norm, even though this clearly isn't the case. Historical evidence strongly suggests that the increasingly pervasive use of IT tends to break markets down into their constituent parts.

DAVID MOSCHELLA is vice president of knowledge strategy at Meanbusiness, an Internet start-up that's building a database of ideas. Contact him at dmoschella@earthlink.net.

Consequently, during these early years of the Internet, we should expect our economy to become more modular, not more integrated.

This has certainly been the pattern within the computer industry. Consider that 20 years ago, just about all of the major players, such as IBM, Digital and Unisys, were vertically integrated manufacturers that built their own hardware, wrote their own software and developed their own sales and service organizations. Beginning with the PC era, this vertical business structure was replaced by a much more horizontal one, with companies such as Intel, Microsoft, Oracle, Cisco, Compaq and Seagate specializing in particular parts of the IT industry value chain.

More recently, this process of what I have labeled "industry dis-integration" has spread throughout the once highly vertically integrated telecommunications business. The postderegulation separation of the telecom equipment and services markets became complete after AT&T's successful spin-off of Lucent in 1996. Since then, the network services business itself has been fragmenting. That America Online could be the dominant online service provider while shedding its own transmission resources speaks volumes about the lack of synergy between transmission capacity and end-user network services.

But what's interesting is how this technology-driven dis-integration is spreading through other traditionally vertically integrated industries such as banking, utilities, publishing, music, insurance, health care and education. It isn't hard to imagine that someday, ATM transactions, credit-card processing, stock trading, business and consumer loans, bill payments and investment advice might all be largely separate financial services businesses. Similarly, the early evidence strongly suggests that online education will break down the traditional integration among curriculum, teacher and school, as many online courses are sold by multiple online education providers.

From the consumer's point of view, this shift from vertical to horizontal business structure is best viewed as a trade-off. Vertically integrated industries are optimized for predictability and simplicity, but usually at the expense of consumer choice and price competition. In contrast, horizontal structures tend to accelerate innovation and heighten efficiency, but they often, at least initially, confront consumers with a dizzying array of choice and change. This is certainly the case on the Internet today.

Of course, corporate IT has already experienced dis-integration firsthand. Outsourcing, contractors, ASPs and other third-party services are all part of the shift toward a more horizontal approach to business IT usage. IT departments can't do everything in-house for the same reasons that IBM couldn't. It's not fast or efficient enough.

But the good news is that because of all these changes, many IT professionals have developed a powerful base of experience. After all, IT is the main driver of dis-integration; you have already witnessed the huge transitions within the computer and telecommunications industries, and you have lived through all manner of IT outsourcing. No one in your organization should understand more deeply how technology can flatten industries and reorganize markets. Thus, while others kibitz the latest megamerger, you need to keep your company focused on the new economy that's emerging.

READERS' LETTERS

More on recycling obsolete computers

I KNOW OF MANY people who would love to have a Pentium-class machine. Any company planning to retire machines may e-mail me so I can put them to good use elsewhere.

Lloyd G. Bryson Jr.
Chagrin Falls, Ohio
lbrysonjr@yahoo.com

THE COMPUTER Recycling Program Inc. in Miami is refurbishing retired equipment and donating it to our community.

Tracy A. Turner
Program director
The Computer Recycling Program Inc.
Miami
trraacy@bellsouth.net

Keep the feds out of our business

KEVIN FOGARTY ["The OPEC of Meat," Business, May 29] reports that the "DOJ and Senate are worried the new [online ticket service that the major airlines are developing] will be anticompetitive because it cuts travel agents out of the loop." He goes on to end his article with "Go get 'em, feds." Give me a break! Does Mr. Fogarty think the government should make it illegal for me to cut my own grass because I might be "cutting out" my lawn care service?

Steve Brazzell
Founder
Innovatum Inc.
Lawrenceville, Ga.
steveb@innovatum.com

Is Windows-bashing simply jealousy?

I FOR ONE am sick of hearing Linux fans rant on Windows [Readers' Letters, June 5]. I've been in the industry for nine years at Windows-only shops, supporting users the whole time. Why is it that I never see machines that crash at least three times a day or witness the horrors of a "technically inferior graphical-interface virus"?

You hear raves about Linux and Mac operating systems, but you see 92% of the offices in the world running Windows. Seems like most of the noise is coming from the 8% of the world that's just sorry they're not where Windows is today.

Bill Frisbee
Systems administrator
Brooks Automation Inc.
Chelmsford, Mass.

Outlook virus fix was 'passive-aggressive'

ALTHOUGH I agree with Dan Gillmor's advice in the column "Rx for Viruses: Get Tough With E-Mail Attachments" [News Opinion, May 29], I have to disagree with his exhortation that "any company that doesn't immediately download and install the upcoming fix for the Outlook vulnerabilities is just begging for more trouble."

Frankly, after Microsoft's first release of the "fix" for Outlook, which was distinctly passive-aggressive in its construction and effect, I think wise systems administrators will take a wait-and-see approach to Microsoft's solution.

Doug Wyatt
Systems administrator
Kohlman Systems Research Inc.
Lawrence, Kan.
ksrftest@sunflower.com

More Letters, page 44

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

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GEOFFREY JAMES

Helping H-1Bs should go beyond bits and bytes

AS USUAL, H-1B VISAS have become a partisan political football. The intense debate continues over whether there really is a shortage of American workers with specific high-tech and information technology skills that's forcing U.S. firms to look outside the country to find qualified workers.

To IT managers looking to fill long-open positions, the ongoing debate is a sad example of how the government is out of touch with the real world.

GEOFFREY JAMES (www.geoffreyjames.com) is the author of the book *Success Secrets from Silicon Valley* (Times Books, 1998).

But what's ironic about this yearly H-1B brouhaha is that most IT managers haven't a clue about how to help engineers for whom English is a second language perform to their full potential. It isn't a matter of technical skills — many H-1B holders are better-trained than their American counterparts. What's missing is a basic understanding of day-to-day English.

Here's a perfect example: A Chinese engineer attended a meeting where the manager warned, "We better get our ducks in line . . . or heads will roll." When asked later what the manager meant, the engineer admitted that he didn't have a clue: "It sounded to me as if he were afraid we would accidentally decapitate a duck."

"Engineers for whom English is a second language are often reluctant to contribute in meetings and brainstorming sessions," says Carolyn Jacobs, founder of Business English Consultants in Exeter, N.H., which teaches English to foreign-born technical personnel at 3Com and other high-tech firms. "The pace in most business meetings is too quick and too full of idiomatic expressions," she explains. "And they get really frustrated because they don't have the language skills to contribute fully."

It's not just a problem in the meeting room, though. The best IT managers realize that the smooth functioning of their groups will depend greatly upon the teamwork and sense of community that's created among their employees. To foster that, they create opportunities for social interaction, which tends to increase the level of team spirit.

Second-language workers, however, are often terrified at the prospect of simple social interactions, even those as rudimentary as having lunch with co-workers. As a result, such workers often feel isolated and alone or, worse, create cliques that speak their own languages. "That's bad for morale because it leads to an 'us vs. them' mentality," warns Jacobs.

"Most second-language engineers would like to get to know their co-workers better," she explains, "but they're afraid that they'll sound stupid if the discussion moves away from their area of technical expertise."

The solution, according to Jacobs, is to work with the foreign-born engineers, both individually and in groups, to improve their spoken English skills to the point where they can navigate the social situations that are an integral part of being a member of a team. "It's amazing how quickly these communication problems improve once these workers are given the right kind of training," Jacobs says.

Unfortunately, many IT managers resist the idea of teaching engineers skills that go beyond technical training. They'd rather complain about the reluctance of Congress to increase the number of H-1B visas than take steps to improve the productivity of the foreign-born workers that are already here.

And that's terribly shortsighted. ▶

ALEX TORRALBAS

Commercial interests have taken over Web

A FEW MONTHS AGO [News Opinion, Jan. 10], I predicted a dot-com shakedown. I felt that if Amazon couldn't make money, almost every other dot-com retailer was pretty much doomed and the stock market would tank.

Well, we haven't seen Armageddon — yet. But one can feel OK about being like Chicken Little watching the skies for stuff crashing to earth — from Iridium satellites to the value of stock options for "irrationally exuberant" employees at those dot-com retailers.

ALEX TORRALBAS is an independent IT consultant and Visual Basic developer in New York. He can be reached at alf@bar.com.

I hate to sound negative, but — finally — lots of chickens have come home to roost, and none too soon. Along the way, the Web has lost most of its charm, as well as much of what made me and millions of others jump on board for a joyride.

The Web was the single reason PC sales took off like a rocket in the consumer space a few years ago, and it still drives most sales. My mom wants a PC, and my mother-in-law just got one. Like most of today's home PC users, she wants it for e-mail and Web surfing and, soon enough, I suspect, chat.

What spoiled it is the commercialization of the Web — the way corporations have jumped in and declared it their property, complete with lawsuits, absurd patents and copyright gestapos stopping teen-agers from running "fan sites" about their favorite shows and the like.

Brick-and-mortar corporations are using the Web to provide fluff and public relations spin for their industries in the guise of being cutting-edge. They see it as a vehicle to push more ads, sell more junk, collect more data and crush their competitors.

Remember Elvis and Chuck?

The Web has gone through the same process rock 'n' roll did. Sure, when Elvis, Chuck Berry and the other '50s pioneers came onto the scene, money and business were in the wings — but you could feel the emotion. And those '60s bands, for all their free love, peace and happiness poses, never turned down royalty checks — but they changed the world, didn't they? By the late '70s, it was just business — and that's true even more so today. The kicks are gone. What was once ours has become theirs.

So if dot-coms are going down in flames, I can't say I'm sorry. Who cares? Who wants to buy toothpaste or dog food online?

What's worse is that the search engines have become little more than funnels for branded products. If a "portal" has deals for, say, mortgages, good luck searching for them without landing on pages that push its tie-in marketing deals.

If the Web ultimately turns into Channel 561 on my TV or into an electronic piece of junk mail, blame it on clueless CEOs and the hype machine — from consultants to ad agencies — that sells them stuff they don't need. For example, why exactly does a maker of toilet paper need a Web presence?

The Web is fantastic for IT folks: I can get the latest patches, upgrades and the like, and, when done right — which is, sadly, not often enough — information from knowledge bases and FAQs that solve my problems. But a great deal of the time, the most useful information comes from sites created by everyday people for the love of the subject matter, not to sell me something.

Now that lots of bad ideas are being seen for what they are, maybe sanity will return to the Web. I doubt it will take hold in any great measure, but it's a start.

Maybe in a year, the Web will have finally found the right balance of commerce and anarchy, and of freedom and responsibility. But first, the lawyers have to chill out, corporations must accept that they don't own the Web, and all of us should get off our duffs, away from the new idiot box, and smell the fresh air once in a while. Or maybe buy a book at the store down the block! ▶

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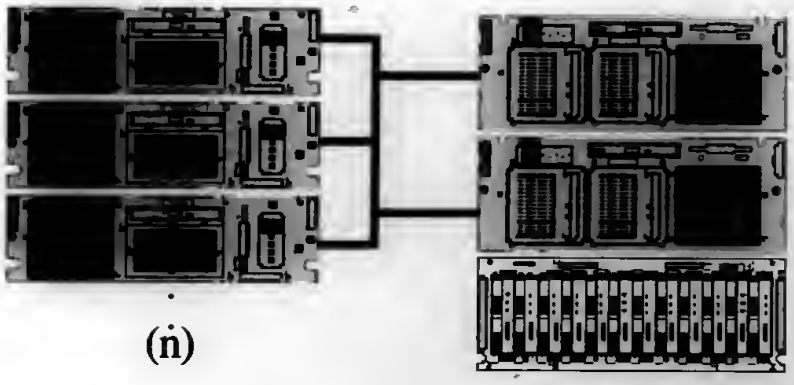

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Older workers insulted

I REMEMBER READING a year ago or so about an industry spokeswoman saying that workers on year 2000 projects would be retained after Jan. 1 because of the valuable company knowledge they had built up. Then, in "Firms Purging Staff With Obsolete Skills" [News, June 5], *Computerworld* documents cases in which firms are *not* retaining staff with this "valuable company knowledge."

There's clear prejudice evidenced by the remarks of many managers that older workers can't retrain. One was quoted as saying that less than 5% of workers could be retrained. That is an egregious insult. After a career mostly in a mainframe environment working on business systems, I achieved a 3.80 GPA on a master's in computer science, graduating when I was 48. There are many like me who could do the same or better.

Bill Patterson
Somerdale, N.J.
patterson@computer.org

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Scrutinize UCITA

JAIKUMAR VIJAYAN'S article "UCITA" [Business QuickStudy, June 5] overlooks a key fact. The Uniform Computer Information Transactions Act (UCITA) was intended to be part of the Uniform Commercial Code (UCC) rather than a separate statute.

Historically, revisions to the UCC have required endorsement from the American Law Institute (ALI). But the ALI refused to endorse the revisions in UCITA. That refusal should have been a red flag for any state considering UCITA.

I'm not saying that the states should automatically follow the ALI. But they should look at the organization's reasons for its decision.

Shmuel (Seymour J.) Metz
Annandale, Va.

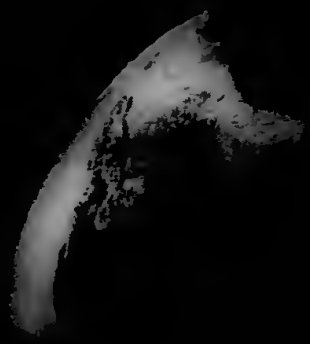
INDIVIDUALS have no power to negotiate license agreements and are stuck with what software vendors put out. To be blunt, it appears that UCITA was written by Microsoft to reinforce its confiscatory actions.

I don't use Microsoft products anymore, choosing instead software from vendors that, in my opinion, are ethical in the treatment of their customers. An example of a license I consider reasonable includes the following:

"You are licensed to use the software on one computer at a time. You may install the software on as many computers as you personally use. However, you (and members of your immediate family) may use only one such installation at a time."

Should such provisions be the required default license, then UCITA might be a good idea. As it now stands, UCITA is nothing more than monopoly protection.

Charles J. Lingo
Ponchatoula, La.
clingo@i-55.com



Is your CRM system
ready for eBusiness?

AS

SIEBEL

Seamless Customer Service in an Online World

eCRM is a mandate for business success in the 21st century

By David J. Wallace

When school bells ring across the United States, more than 70 million students pick up textbooks from a single publisher. How does Pearson Education, the world's largest educational publisher, handle questions from tens of thousands of educators about its books?

Pearson has nearly 400 agents in three customer contact centers in New Jersey, Ohio, and Indiana answering e-mail messages, phone calls, faxes, and Web mail inquiries simultaneously. As agents handle queries, they have instant access to purchase histories, contact information, and other data and can direct calls to specialized agents.

Calls from mathematics professors, for example, can be routed to specialists who know the subject intimately. Making it easier for the company to answer questions lets agents spend more time on tougher projects, says George Logan, vice president for applications development at Pearson Technology. Self-service is another large component of customer service. Many customers just need the tools to find the answers they seek.

"Five years ago, a lot of our customers didn't have PCs. Today they do, and they're willing to use those tools to go after information and handle transactions themselves," Logan says. "Almost 63 percent of the transactions coming into our call centers are self-handled. That frees up agents to handle real problems, like scheduling an author's appearance, cross-selling additional materials, or providing more service to the customer."

Getting right answers fast was no academic exercise. A 1999 merger brought together Simon & Schuster's educational imprints and Addison-Wesley Longman, forming Pearson Education. The company met the challenge of integrating those systems to work seamlessly. And when Hurricane Floyd knocked out the New Jersey contact center, the facilities in Lebanon, Ind., and Columbus, Ohio, provided emergency backup with no interruptions.

"Pearson has multiple call centers handling help desk questions, credit and collections, and orders via e-mail, Web, phone, and fax," says Christian Kuiphoff, director of applications development at the technology division's Old Tappan, N.J., headquarters. "We needed to bring all those communication channels together and manage them effectively, then gather data on the activity."

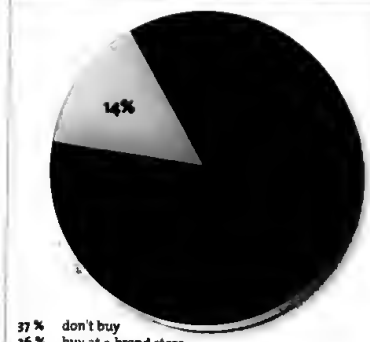
To create a CRM system that unified all the customer contact points and gave agents the most accurate and up-to-date information, Pearson turned to Aspect Communications, based in San Jose, Calif. The Aspect solution integrated all the communication channels, giving agents the tools to service customers quickly and successfully, no matter how customers contacted a company.

According to Forrester Research Inc. of Cambridge, Mass., the customer is knocking on more than one door. In 1997, customer contact came via telephone 97 percent of the time; 2 percent via e-mail, and 1 percent from the Web. In just two years, in 1999, phone calls had dropped to 60

percent. e-mail increased to 23 percent, and Web inquiries grew to 14 percent. That trend will only accelerate.

Besides encouraging inbound contact with superior customer service, Kuiphoff wanted to learn more about customers. Self-service users, in particular, leave valuable clues about the systems use in the "clickstream," traceable patterns that show exactly where Web surfers used the online interface and how long it took to complete their task. This will let Pearson analyze user experiences, buying patterns, and customer satisfaction, says Kuiphoff.

"You have to extend corporate memory by recalling the outcome of every interaction," advises David Puglia, Aspect's vice president of product marketing. "The typical CRM architecture is not synchronized with an eCommerce site and a customer relationship portal. All those communication channels may be owned by separate organizations—the front office sales and service organizations and back-office functions like finance or collection. They all need to work together seamlessly."



Zona Research

KEEPING CUSTOMERS

Web surfers can switch from one bank to another in a few keystrokes. Gone are the days of visiting branches all over town. They can get account information from any phone or keyboard and get banks to come to them. And they won't endure delays or confusion in solving their problems.

"Customers are impatient with the lack of coordination between business units or contact points," says Laurie Orlov, director for eBusiness applications at Forrester Research. "They don't want to repeat their account number several times between calling or other forms of contact."

For Houston-based Bank United, the mission was simple: Make contact with the customer in any manner he or she prefers, and in the customer's language. That was no small goal, but executives realized the importance of Web technology at the center of the customer experience.

"Our objective is to be always available to customers," says Wayne Sadin, chief information officer for the bank. "Each of the media types has different characteristics, but each needs to work with the others. Using the integrated solution from Aspect, the bank has the power of each medium and the ability to converge all interactions into a single pool in the contact center."

That convergence ensures that high-quality personnel aren't wasting their time on simple queries that can be handled automatically. Bank United offers live Web chat for people completing forms online who may need help. An agent can instantly view the customer's form in real time and help complete an application more easily than answering questions by phone, ensuring that a form gets submitted instead of being abandoned.

Using tools from Aspect Communications, the bank can analyze patterns and trends in customer interaction to schedule agents better when demand is greatest. Transaction and demographic data help the bank make decisions, enabling every agent to deliver personalized service and content on demand, Sadin says.

With plans to offer wireless access and video communications to the menu in the future, the infrastructure is in place for future-proofing, Sadin adds.

"Aspect can grow to suit our needs, and it allows us to network our contact centers together for load-balancing and disaster recovery," he says. "We need to manage a very expensive, scarce resource—the people in the contact center—and if customers need help that only an agent can provide, they will reach an agent in the way they choose."

CRM MADE EASY

Business processes are no longer simple exercises like requiring store clerks to make eye contact and address the customer by name. Today's companies want 24-hour access to consumers and partners, suppliers, and financiers, with near-immediate responses and real-time, online answers. Aspect enables this fast-forward model with Aspect® eBusiness Architect.

"You can now create an application with instant information in weeks, not months," says Sudhakar Kondisetty, senior manager, product strategy and planning, at Aspect. "Imagine how many systems need to be strung together to complete a single online transaction—from the Web site to the customer database, plus any external partner connections like suppliers and distributors. With eBusiness Architect, users can create enterprise eBusiness

Managing the Cost of Customer Service

When you're talking about measuring customer results, you need to explore several definitions of success or failure. With one approach, you may reduce costs but at the expense of sales. For businesses with subscription-based products, churn rates, pricing, and customer service are useful metrics for evaluating performance. If your objective is simply to cut the number of calls to a customer service line, then increasing wait times or limiting open hours will do the trick.

But smart companies can lower costs while increasing service. They are shifting to self-service contact centers for routine inquiries and then transferring higher-value calls to agents who are trained to handle questions and prepared to offer cross-selling or up-selling when it's most effective for the customer's need—not just when a customer is motivated by incentives or excess inventory.

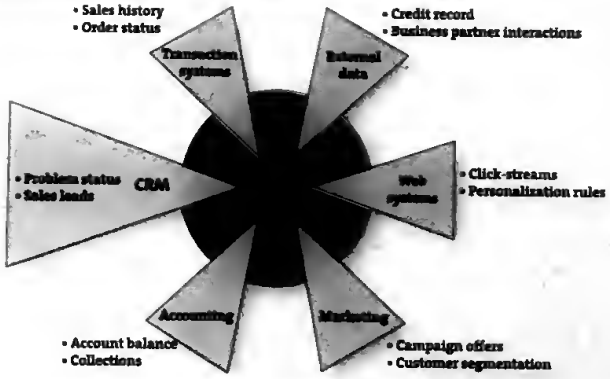
DO YOU WANT TO:

- **Reduce the number of contacts needed to resolve a customer issue?**
- **Extract more value from every contact?**
- **Identify revenue generated or costs incurred on every contact?**
- **Chart the close rate for sales divided by the number of total contacts?**
- **All of the above?**

Distributed multimedia contact centers bring together all the different customer interactions. Agents are able to close a higher percentage of sales using the Web, cross-sell using information available right on the agent's desktop, or use dynamic scripting to identify a customer and then look for key account facts. In one case, 70 percent of incoming calls were requests to check on an account balance. The system cross-checked the database, and if a payment were due in three days, the caller would be reminded via a separate voice-response prompt.

"When we talk about the value in the solution, it's the ability to reduce the number of contacts customers must make to get their answer," says Alan Klapper, solutions marketing manager at Aspect Communications. "That results in improved personalization of the contact and lets the agent know who the customer is, so the agent can provide excellent service every time."

CRM Applications Can't Manage the Whole Relationship



The Forrester Report. The Demise of CRM. June 1999

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CRM on steroids Faster thanks to intelligent systems that can auto matically update a client record more complete when they can encompass contact made by phone fax e mail, Web mail or in person inquiry, ubiquitous, because those records are available to a store clerk, contact center service agent, sales person or any other client contact

An approach to marketing based on a company's ability to use customized information about a particular cus tomer and his or her needs to tailor a suite of products or services for that individual This approach can also help predict a future need and prepare a company to meet that need. For example a mortgage applicant might also want to know about mortgage insurance, financial planning software, life insurance or moving services

An extension of a company's network to include suppliers and channel sales partners Most often using an ASP to host the new system, a manufacturer can use technology tools such as secure e-mail or shared Web sites to create a better working relationship with suppliers of parts, sellers of products, and marketing or finance departments that may be thousands of miles from each other Up-to the minute production and sales data can be used to fine-tune marketing budgets, regional allocations or credit and manufacturing decisions.

Marketing approach in which a company asks a client or prospect for a proval before sending e-mail that might be of interest Unlike traditional advertising that costs more every time a commercial appears, it costs nothing to send repeat e-mails The key is knowing when a business is sending too many and potentially annoying the audience Permission marketing tells when recipients are willing to receive a message and, sometimes, how often or where they would be prefer to be contacted

processes called eFlows in a visual, drag-and-drop environment and be confident that every part of it will work."

Every party to a transaction is notified as soon as the customer clicks the buy button, from the credit card company whose card was used, to suppliers of product who need to replenish inventory, to shippers who need to reserve space on the next truck.

Aspect's eBusiness Architect is a tool designed to reduce costs and speed implementation. With eBusiness Architect, enterprise applications can be deployed very quickly, enabling rapid responses to changing business conditions. Aspect eBusiness Architect enables companies to integrate front-office and back-office applications with customer service, directing all customer communications according to well-defined business rules.

So, whether a call or e-mail comes in seeking support or service, or a customer wants to complete an online transaction, eBusiness Architect can facilitate the creation of all such eFlows visually. The same eFlows can incorporate any cross-sell or up-sell steps or personalization steps to keep the customer engaged.

Regardless of the information systems and despite conditions that can spread a company's operations across thousands of miles, Aspect's eBusiness Architect can create a higher standard for customer service.

Some call it eCRM.

Others just call it eBusiness.

Whatever you call it, it's a new source of cost reduction, increased productivity, and more seamless information for you and your customers. ■

CRM Spells "Customer Retention Manager"

Customers no longer have the patience for uninformed service agents and companies that don't understand their needs

By David Puglia
VP-Product Marketing
Aspect Communications

It's no wonder buyers and sellers hardly recognize each other. Buyers can purchase from more sellers than ever before, using more distribution outlets and more forms of payment.

Consumers gained tremendous power as the Internet opened up new options for comparison shopping, direct purchasing from manufacturers, and price research. Now the makers and sellers of products and services can put technology to work, providing a still-greater benefit to the customer.

"In the new century, 'dynamic trade' renders obsolete the old strategies for selling goods and services as companies work to satisfy current demands with customized responses to all inquiries. Current methods of managing customer information are already outdated because customers select the channel through which they want to transact business and the vendor they prefer," said Laurie Orlov, director of eBusiness applications at Forrester Research Inc. in Cambridge, Mass.

Customer relationship management tools—often little more than records of past transactions and inquiries—need to be expanded to include electronic relationship management (eRM), according to Forrester Research. New eRM systems that track every customer interaction, customizing responses for instant answers that suit their needs, will quickly become the standard for any business. Tailoring information based on the customer's requirements—not just what you have in stock or are willing to provide—demonstrates the company has a memory. It's hard work, but there is really no choice.

A key component of eRM are the systems that predict and prepare for customer demand. Roses sell well before Valentine's Day, but are there other buying patterns among your customers that existing systems have not yet discerned? This is not about mining the data mart or data warehouse, but maintaining current records based on that day's activity. If someone places an order using the Web

and later calls to ask about it—that customer expects your call center contact to know about the order. Today, many organizations still can't do that.

Forrester surveyed large corporations and found that only 2 percent of companies have a single, integrated view of their customer information today, though 38 percent expect to achieve it by 2001. They may not know precisely how to achieve it, but know they need it. Very quickly, fully integrated customer knowledge systems will not be a competitive edge. They will be a minimum requirement.

In the world of "dynamic trade," manufacturing occurs on a just-in-time basis as orders trigger automatic pass-through orders from makers to suppliers and countless other parts and systems. For services and products, pricing increasingly matches market conditions—rising when demand is high and vice versa. Time-sensitive items like hotel rooms and produce are priced as the market changes, minute by minute.

To work in this fast-moving environment, companies need dynamic content directories, with solutions to problems in the context dictated by the customer. From interactions with customers, patterns emerge for relevant sales and marketing, dynamic cross-selling and up-selling.

Plain-vanilla CRM doesn't synchronize, it focuses on record-keeping, not relationships. Successful CRM, or eCRM, mandates cross-channel integration, assuring that every customer contact point is provided with the latest, up-to-date information on the customer.

"Personalization is not trivial," says Orlov. "It's more than simply drilling your staff to address the client by name during a conversation. And it's worse if you execute it badly than if you don't do it at all. How often have you gotten an e-mail addressed to someone with a similar name?"

At a prestigious hotel, she was sent a gift by the manager. When it was delivered to her room, it included a thank-you card praising her repeat visits and loyal patronage.

Someone else's name was on the gift card.

Make that mistake with a medical record, loan application, or similarly sensitive document, and you risk losing more than a customer. Handle the transaction seamlessly, however, and you stand to gain more than just a sale.

Now, who is getting the greater value from every transaction? Buyer or seller? In the Web economy, the buyer and seller can be juxtaposed in an instant. Any eCRM system must be able to handle this time-critical dynamic in that same instant. ■

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BUSINESS

CAR SALES TAG TEAM

Saturn plans to offer inspections of used cars sold on eBay. The online auction site hopes the inspections will boost confidence in buying cars on the Web. The automaker hopes the service will attract sellers of used cars into its showrooms when they buy new cars. ▸ 50

MEETING OF THE MINDS

It takes more than just a good idea to foster real progress, writes Kevin Fogarty. Too often, businesses are divided along operational lines. There might be some crossover between departments, but it often only scratches the surface. In order to truly succeed in e-commerce, Fogarty says, businesses need to find new ways to eliminate those lines of division. ▸ 50

SERVICE STRUGGLES

Several years ago, companies started catching on to the need for strong customer relationship management systems. But many have stumbled as they've tried to get these systems up and running. Even today, companies are still trying to tweak their systems to meet customer demands. ▸ 51

KEEPING WATCH

The quick pace of Internet projects has thrown a wrench in many companies' offshore development plans, according to analysts. The speed of the Internet increases the likelihood that problems cropping up, especially in projects undertaken by offshore vendors. The solution, say analysts and experts, is sharper project management. ▸ 52

STANDING GUARD

Gregory Schaffer, director of the digital risk management and forensics investigations practice at PricewaterhouseCoopers, shares his thoughts on the future of IT security at *Computerworld*'s Premiere 100 event. And in an interview with reporter Ann Harrison, he offers advice on how companies can best protect themselves from security threats. ▸ 56

LIFE WITH THE DOUGHBOY

What's it like to work in IT at Pillsbury? Well, for one thing, there's always plenty of good food on hand. Leo Timmons, senior manager for e-business in the company's development technologies group, offers more insights on working with the Pillsbury Doughboy. ▸ 58

PAYING FOR E-COMMERCE

How do you bankroll sometimes-expensive e-commerce projects? The options can be simpler than you might think. ▸ 60

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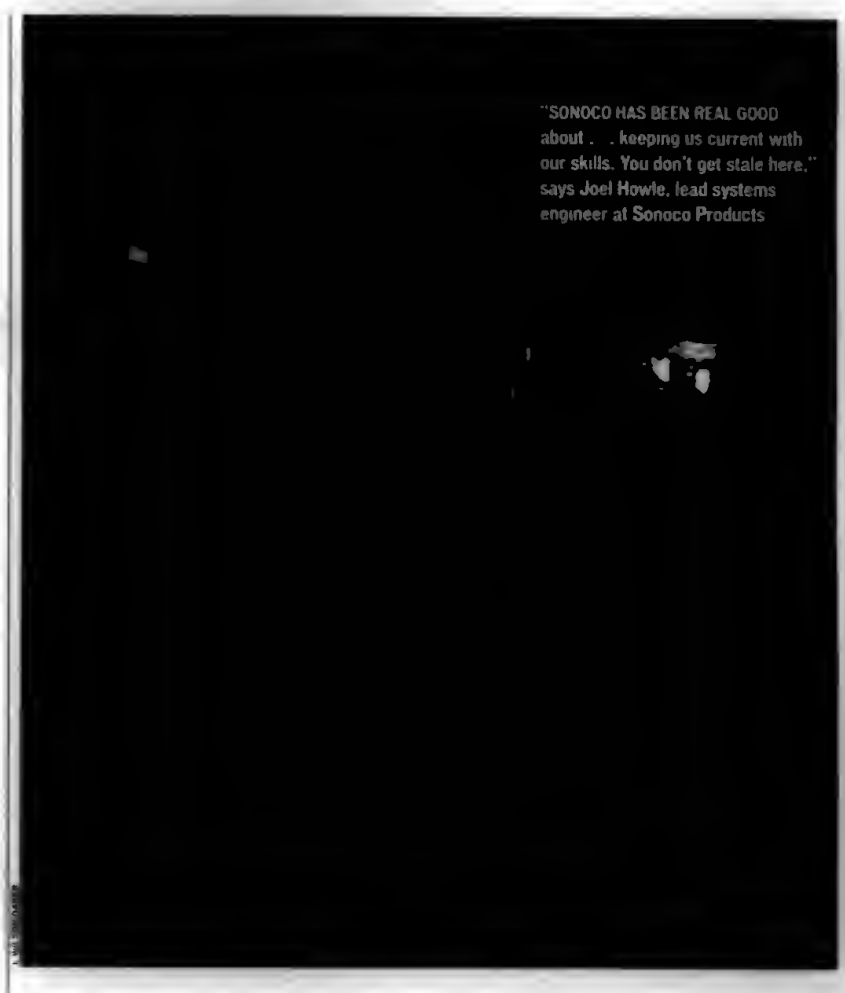

"SONOCO HAS BEEN REAL GOOD about . . . keeping us current with our skills. You don't get stale here," says Joel Howle, lead systems engineer at Sonoco Products

BEST PLACES TO WORK IN IT

NOTHING IS MORE IMPORTANT to technologists than technology, and the surest way to keep IT pros onboard is to invest in their career development and give them access to key skills and hot projects. In the final installments of *Computerworld*'s series on the Best Places to Work in IT, we look at the leading employers for career development and hot projects.

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Saturn, eBay Team Up to Boost New, Used Car Sales

Automaker offers to inspect used cars on auction site

BY LEE COPELAND

GENERAL MOTORS Corp.'s slumping Saturn Corp. unit wants to kick-start new-car sales by offering to inspect used vehicles that are offered for sale on eBay Inc.'s auction Web site.

Saturn officials said they hope the inspection service will drive potential new-car buyers into the company's dealerships and boost stagnant sales.

Earlier this month, the Spring Hill, Tenn.-based automaker and eBay struck a deal under which Saturn will inspect any make or model of used vehicle. The 30-minute, 135-point inspection service will be marketed through eBay's automobile auction site and will cost car sellers less than $100. Vehicle owners may post the inspection results with their auction listing at *www.ebaymotors.com*.

"Store traffic is something we are interested in, [as well as] exposing Saturn to a wide auto-buying public through Internet exposure," said Bill Betts, a Saturn spokesman. "We believe the Internet gives customers a wonderful opportunity to do car shopping online, and we want to take full advantage of that."

Founded in 1990, Saturn saw its sales peak in 1995 at 285,000 cars, but sales have dropped each year since. Saturn sold roughly 231,000 cars in 1998 and 1999. June sales of Saturn's SC and SL coupes dropped 22% and 29%, respectively, from last year. Sales of its SW wagon were off 42% from the same period last year.

The inspection service is slated to launch next month through Saturn retailers in Nashville, Houston and Indianapolis. It should be available through most of Saturn's 400 retailers nationwide by year's end.

Buying a Lemon

Thilo Koslowski, an automotive analyst at Gartner Group Inc. in Stamford, Conn., said inspections from a trusted third party address a significant obstacle in online sales of used vehicles.

"If you look at used car sales, compared to new-car sales, there are less consumers using the Internet for used cars," explained Koslowski. "It's a trust thing. People don't feel confident about buying a used car from a Web site, because what if you get it home and something is wrong with it?"

J. D. Power and Associates pegs the used vehicle market at $370 billion per year, estimating that 26% of used car shoppers employed the Internet last year before buying a vehicle in person. That's up from 14% in 1998.

SATURN HOPES its deal with eBay will boost sales of new cars like these

EBay expects used car inspections to give an extra measure of assurance to potential buyers, said Russel Brady, an eBay spokesman. EBay, which derives 25% of its sales volume from car transactions, began selling used vehicles online last year.

Saturn and eBay aren't the first companies to offer inspection services for vehicles sold online.

For example, start-up BestOffer.com Inc. in San Francisco offers used car inspections in San Francisco and Los Angeles as part of its used vehicle online auction service. The 108-point inspection costs $99 and comes with a 3,000-mile powertrain warranty to buyers.

And iMotors.com, also based in San Francisco, finds used vehicles for customers in California, New York, Oregon and Washington. It also offers a three-month 3,000-mile warranty and seven-day money-back guarantee.

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KEVIN FOGARTY/BRICKS AND CLICKS

Ideas aren't enough

SOMETIMES, IT'S NOT what you know, it's what *else* you know.

In his Pulitzer Prize-winning philosopho-history *Guns, Germs, and Steel: The Fates of Human Societies*, Jared Diamond says human societies develop at different rates, but not because of differences in intelligence or ambition. Instead, he argues, some develop faster because of almost accidental alignments of specific technological developments.

In Europe, for example, the wheel and the domesticated beast of burden were both available early, making it easier for farmers to bring goods to local and regional markets. That mobility strengthened local economies and made it easier to fund long-distance trade, which strengthened the economy further.

An ocean away, the Aztecs had the wheel, but no beasts of burden except one another. Farther south, llamas bore burdens over the Andes, but the wheel remained unused. That limited the reach of even the great Mayan and Aztec civilizations.

The lesson? Even great ideas will die lonely deaths if they aren't nurtured and brought together with the other great ideas that can help them blossom.

That may sound obvious. But it's not the way most organizations work. Most companies are divided along operational lines, so people in marketing may never be able to find the IT people with the right ideas about the back-end technology that would make a radically great idea work.

E-commerce makes up so small a

Like ERP, CRM Systems Can Be a Struggle to Launch

Y2k projects, integration of legacy systems hamper installations

BY MELISSA SOLOMON

Customer relationship management (CRM) systems have become the new Holy Grail of high-end corporate computing. But like the famously difficult last Holy Grail — enterprise resource planning systems — getting them up and running is harder than it looks.

For example, a few years ago, Toronto-based Canadian Tire Corp. Ltd. found itself drowning in its own systems.

In 1996, the chain of 430-plus home goods department stores decided to consolidate its 21 call centers and multiple back-end databases, said Steve Folkerts, solutions consultant at Canadian Tire Acceptance Ltd., the company's financial services arm.

"Our reps couldn't possibly take time to build a relationship with the customer because they had to take too much time building relationships with the systems," Folkerts said.

But once company officials were able to justify the cost of the call center integration, they realized they also needed a strong CRM system, he said.

Once the CRM system was selected, however, officials decided it needed to be tied to the company's legacy databases.

"We didn't own all of those back-end systems," Folkerts explained. "Nor was it cost effective to build that kind of industrial-strength integration."

So in late 1998, the company purchased Seattle-based WRQ Inc.'s Apptrieve host-integration system, which includes a graphical mapping tool, a development kit and a strong server. Apptrieve helped Canadian Tire link its legacy databases and tie them to its new CRM system.

Ironing Out the Kinks

Like Canadian Tire, many firms started catching on to CRM systems a few years ago but ran into so many kinks connecting to legacy systems that they're not done yet, said Chris Selland, an analyst at The Yankee Group in Boston.

Canadian Tire launched a pilot of its system in March 1999. But the system quickly stumbled when the company had to refocus its energies to solve unexpected Y2k date-change problems.

Now, with Y2k projects over, the company is rolling out the first phase of its new unified systems. "All of a sudden, I had a strong back end and an easy user interface," said Folkerts. "It was like my dream come true."

The next steps, he said, are to add Internet and e-mail channels to Canadian Tire's customer service system and to boost customer self-service functions on the Web.

FOLKERTS: CRM/database integration was tough, but it has paid off

Single Focus

Charles Schwab & Co. in San Francisco experienced similar growing pains in building its Web-focused customer system, but it worked through them faster.

"We had initially started Schwab.com as a separate company," said Martha Deevy, senior vice president of Schwab's electronic brokerage unit. "But our customers raised up their hands and said, 'We don't like this bifurcated model. . . . We want you to merge it.' " (A profile of Schwab co-CEO Dave Pottruck is on page 66.)

It didn't take long for Schwab officials to realize that the online and offline businesses needed to come together, Deevy said.

"Customers want to go where they can get their answers most quickly and where they feel most confident that they're going to get the problem resolved," she said.

Having integrated the electronic and physical brokerages, Schwab is now hosting online forums, where customers can interact with representatives in real time, said Deevy.

The company is also piloting the use of America Online Inc.'s Instant Messenger on its sites, as well as other services aimed at "bringing that human interaction to the Web," she said.

And while Deevy pays attention to customers' online experiences, one of her colleagues is doing the same for customers in Schwab's branch offices.

"We're continually challenging each other to say, 'I can do this online. Can you do this in the branches?' " she said. "It's a very productive tension."

part of the overall revenue stream that divisional managers with profit-and-loss responsibilities have little incentive to help out budding e-commerce projects, even when everyone "knows" e-commerce is the wave of the future.

So the e-commerce group — often separated from the rest of the company to allow it to move faster — is left to build the e-business without the help of the people who are specialists in developing, marketing and selling the specific products of the company. So the company pays hundreds of thousands of dollars for the generic knowledge of consultants instead.

What's the solution? Some companies appoint an e-commerce czar, who is empowered to reach across divisional lines. But too often that power is basically limited to asking the divisional chiefs for favors or loans of staffers or resources. That's not enough.

Kevin Fogarty is Computerworld's Business editor. Contact him at kevin_fogarty@computerworld.com

What e-commerce groups really need is outreach — a group of ambassadors whose job it is to circulate among the other departments and divisions and learn what they do for a living. Those ambassadors have to understand the business, as well as the mind-set of the people they're talking to. And they must be able to harvest the ideas of those specialists and figure out what makes sense online.

They need the business savvy to know which ideas are important, the technical skills to know what will work and specific permission from top management to go out among the masses and pull together the ideas and the infrastructure to make the best ideas reality.

But most of all, they need the consistent, long-term support of top management. Otherwise, a winning idea and the technology that would make it work might as well be an ocean apart.

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Offshore Projects Present New Challenges

BY JULEKHA DASH

With offshore work expected to triple in the next three years, companies will likely face new challenges managing projects with shorter life cycles, analysts said.

For years, U.S. firms seeking to capitalize on lower costs in developing countries have sent technology projects overseas. But, experts say, as more firms rely on offshore labor to perform Web hosting, design and other Internet-related work that requires shorter cycle times, users need better project management skills.

While some types of offshore work, such as the rollout of an enterprise resource planning system or a software migration, may take between 12 and 18 months, Internet-related projects typically take just one to three months, according to Farley Blackman, CEO of StrategIM Corp., an offshore consultancy in Burlington, Vt.

Though any offshore project requires solid management skills, a shorter time frame to complete the work means that users have less room for failure.

Shorter time frames require companies to be "more proactive in managing their offshore operations," said Blackman, who is also a former director of offshore development at General Electric Co. in Fairfield, Conn.

According to Reid Rasmussen, managing director of the Asian Pacific region at Input, an information technology research firm in Chantilly, Va., the North American offshore market is expected to grow from almost $10 billion last year to $60 billion in 2003.

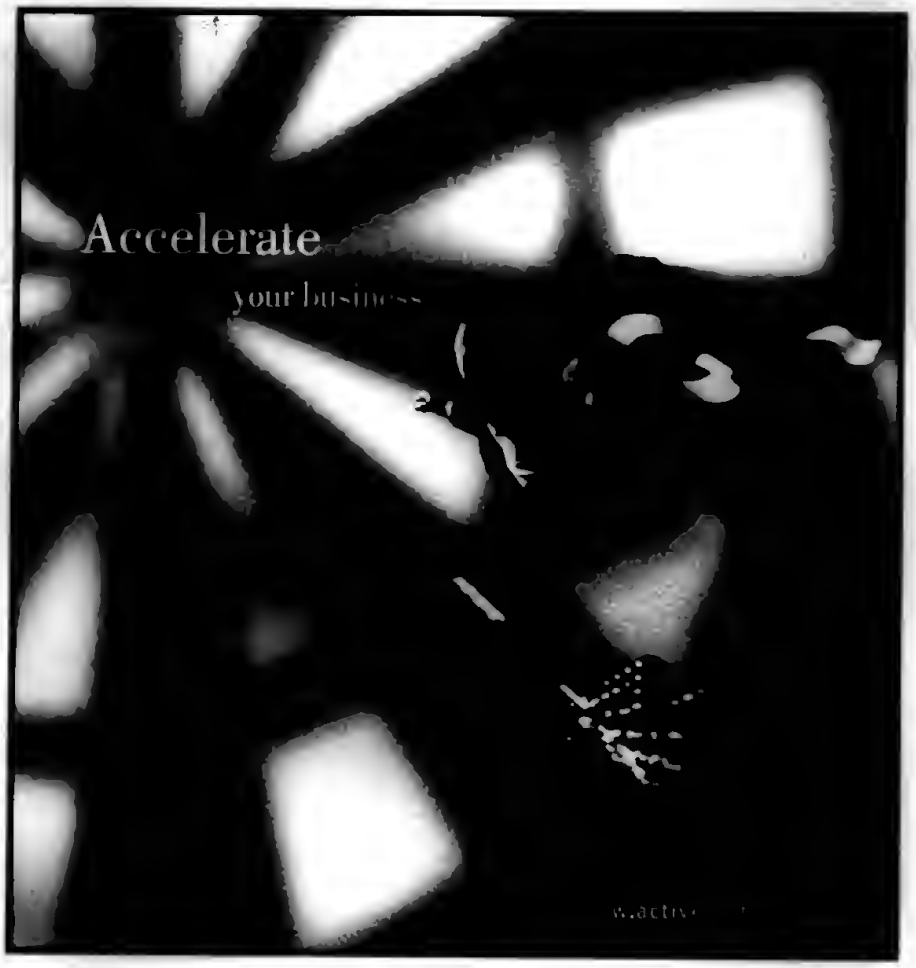
Report Cards Tell All

When a company hires an offshore services firm, the first step is to make sure its own expectations match those of its vendor, according to Al Hackney, CIO of commercial finance at Bank of America Corp. in Charlotte, N.C., who has managed offshore projects.

Hackney also recommended holding ongoing reviews of the company performing the work and defining the project's requirements as tightly as possible. "The more tightly you can describe a project, the more it becomes a candidate for offshore development," he said.

Offshore provider contracts should include requirements for skills such as planning, scheduling and team leadership, said Gopal Kapur, president of the Center for Project Management in San Ramon, Calif. But only about 10% of all offshore contracts include such specifications, he said.

Before signing an offshore contract, users should create a profile of the skills they expect from their vendors' staffs, said Kapur. Also, the vendor should send a report card every two weeks for milestones that have been reached, how close the company is to meeting deliverables and actual total costs vs. estimates, he said.



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WIRED AND READY IN THE ENTERPRISE

TOOLS, TECHNOLOGIES & TRENDS FOR THE MOBILE WORKER

Over the past two years, IT departments have been obsessed with clearing off desktops located throughout an organization. No, it's not part of some massive clean-up campaign, but rather an effort to replace larger desktop PCs with smaller and more mobile notebook computers. These devices take up less physical real estate, can be equipped to be just as flexible as desktop PCs and support a variety of new chip and performance acceleration technologies that open up new application windows for these small systems.

Mobile Insights

Most important, they can be easily "unplugged" from a company's LAN and used throughout a building, a campus or in the field. With the advent of remote networking and wireless connectivity these systems can also perform much like stationary systems, but from a client's office or directly from a manufacturing line. They are a mobile worker's window into the corporate data resource.

Handheld and smaller systems are also coming on strong as supplementary computer devices that provide links to data resources and corporate e-mail. Systems based on Palm Inc.'s Palm OS, Microsoft Corp.'s Pocket PC and other operating environments have extended the reach of both desktop and notebook systems in the field. Web-enabled cellular telephones and two-way paging devices are also being used by mobile workers to maintain vital links to e-mail, inventory and connections up and down the supply chain.

In fact, in December, sales of personal digital assistants (PDAs) grew by nearly 170% over the same month a year earlier, according to one study. And a lot of these small devices are now on the approved buying list of most Fortune 1,000 organizations, following several years of coming in the "back door" as personal and "bidden" purchases.

The Changing Face of Notebook PCs

Looking back about 10 years, the average enterprise IT organization barely had the terms "laptop" and "notebook" on their radar screens. In the early 1990s, the mobile computing revolution was just starting to take shape and early adopters were the only workers within an enterprise who had these devices in their possession. In most cases, these pioneers took their first steps into mobile computing on their own time, not under the auspices of their IT shop. Back then, IT had its hands full with the current technology, which at the time was the still rela-

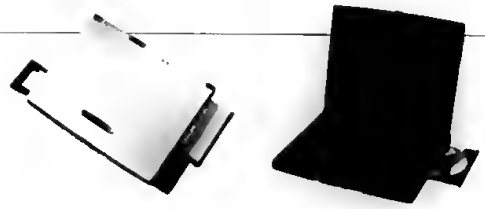
tively new desktop PC

Fast forward a decade and you see an entirely new enterprise computing landscape. The typical enterprise today has implemented mobile computing within its organization to some degree. This may vary from small islands of mobile technology to massive deployments of notebooks that are entirely replacing the organization's existing desktop systems. In fact, the "desktop replacement" trend is one of the hottest and most reported trends of the last couple of years, with large organizations such as Intel Corp. proclaiming its internal notebook-to-desktop ratio will reach 80-20 in 18 to 24 months (they are now at 50-50). This is a reverse of the ratio in existence a mere 18 months ago. Other organizations such as Bank of America Corp. and Wells Fargo are reporting similar trends. And enterprise notebook installments are increasing steadily, as more organizations realize that the total costs/benefits of ownership far outweigh the higher initial outlay of funds required to purchase and support mobile computers. At Mobile Insights' Go Mobile conference held in September 1999, 168 IT organizations indicated that they would purchase an average of 2,495 portable PCs in the twelve month period from September 1999 through September 2000. This group also stated that their average budget for portable PC hardware and software was about $3.2 million. Industry statistics show that there are more than 55 million notebooks in the world today and about 15 million new notebooks arriving each year. Enterprises of all sizes are embracing portable computer technology, and the largest chunk of money spent will go toward new and upgraded notebooks.

Mobile Insights is an analyst and consulting firm based in Mountain View, Calif. It focuses on the mobile computing and data communications market. The company has an online newsletter, *Mobile Letter*, MobileTrax Online subscription-based research service and produces several mobile computing conferences. For additional information, visit their web site: *www.mobileinsights.com*.

As enterprises contemplate their notebook purchasing decisions in the next six to 12 months, they will be looking at some options that weren't available to them at this time last year. For instance, last year's Go Mobile attendees stated that close to 70% of the notebooks they purchased were of the desktop replacement category, as opposed to 23% in the thin and light category, 7% in the ultraportable category and only 2% in the ultralite category. Today and moving forward, the definition of desktop replacement notebook is evolving. Whereas historically we have thought of a desktop replacement as a "three-spindle," all-in-one box containing a hard disk drive, a floppy drive, a CD-ROM drive and all of the necessary ports for expansion, we are beginning to see two-spindle, or two-bay, machines that qualify as desktop replacements.

For example, Acer America Corp. earlier this year introduced its TravelMate 600, which has no floppy drive, but instead has a built-in CD-RW drive, offering an enhanced mass storage option for users. Acer is betting on the eventual obsolescence of the floppy drive, which Mobile Insights believes is a pretty good bet. For connectivity, the two-spindle TravelMate 600 series notebooks also feature two USB



Acer TravelMate 600 is a two-spindle design with a built-in CD-RW drive for enhanced mass storage

ports and a uniquely designed parallel/serial port adapter that attaches to a proprietary port on the back of the computer — these legacy ports have been removed from the box.

In addition to the evolving desktop equivalency issue, there are several other major technological advances in notebook computing that have come about in the last year, specifically in the areas of processors, displays and hard disks. Earlier this year, Intel introduced its SpeedStep technology, which allows mobile computer users to achieve desktop parity in clock speed when plugged in. When unplugged, the processor automatically decreases to a lower clock speed for more efficient system usage while on battery power.

Notebook displays have progressed from sub-10-in. diagonal gas plasma screens to brilliant, bright active matrix LCDs that now measure up to 15-in. The viewing experience on a notebook with a 15-in. display rivals that of a 17-in. desktop monitor. There are now very few applications that are not suitable for viewing on a notebook display. From spreadsheet-producing number crunchers to software designers, there's a display suitable for even the most demanding pair of eyes.

Strides have also been made in hard-disk technology, which have been necessitated by the overwhelming storage needs being driven by multimedia content and the Internet. The earliest notebook computers had hard disk drives that were measured in megabytes, not gigabytes, but most enterprise users in those days (the late 1980s) were mainly working with word processing documents and spreadsheets. Today, you can purchase a high-end laptop with up to an 18G-byte hard drive, and the average new notebook offering 6G-bytes. But this will seem low in another year. IBM, for example, recently introduced its Travelstar 32GH. When it ships in August it will provide 32G bytes of data in a 12.5mm height form factor and will hold up to eight DVD movies, 32,000 high-resolution digital photographs, 49 music CDs or the text equivalent of a 5,344-foot stack of documents. The lower-capacity Travelstar 20GN (20G-bytes) and Travelstar 30GT (30G-bytes) drives were scheduled to ship in volume in May to Compaq Computer Corp., Dell Computer Corp., Gateway Inc. and the IBM Personal Systems Group, so we expect to see even higher-capacity notebooks by year-end.

Newer technologies will also be built into notebooks. For instance, by this time next year, we will begin to see notebooks with an integrated Bluetooth local communications capability. This short-range wireless capability will allow users of Bluetooth-enabled devices to exchange files wirelessly. Users will be able to exchange data among all of their devices, from notebooks to cell phones to personal digital assistants(PDAs), even printers, digital cameras and set-top boxes.

For long-range wireless capability, wireless LAN cards and an increasing wireless network across the country are making wireless communications via notebooks a reality. Hotels and airports are rapidly installing wireless hubs. The goal is to provide "unconscious portability," with seamless and ubiquitous connectivity on campus (through LANs), off campus (through WANs) and in your personal space (through PANs, or personal area networks). In about a year, we will see wireless integration in notebooks through mini-PCI and integrated antennas. As a result, data synchronization among multiple devices will become easier to accomplish.

Notebooks' internal hard drives are growing in capacity; IBM's recently announced Travelstar 32GH provides 32G bytes of internal storage

As vendors begin to remove legacy ports from notebooks, as Acer has done with its TravelMate 600, "universal port replicators" will help enterprises make the transition toward legacy-free notebooks. Devices such as Mobility Electronics Inc.'s EasiDock 1000E, Portsmith's Portsmith Express, and Xircom Inc.'s PortStation were all introduced in the last six months, providing low-cost alternatives to proprietary docking and port replicator solutions.

One area of notebooks that has not seen rapid development is battery technology. Even with the advent of dual-mode processors from both Intel and Advanced Micro Devices Inc., battery life on a notebook is typically three hours or less. Newer technologies like lithium polymer, which can be molded into smaller and tighter spaces than Lithium-Ion batteries, have yet to show their mettle. Electrofuel has created a Lithium-Ion SuperPolymer battery, called the PowerPad, that is about the size of a sheet of paper and about 3/8-in. thick. This battery, which is currently available for notebooks made by IBM, Toshiba America Inc., Acer, Compaq Computer Corp. and NEC USA Inc., provides up to 16 hours of life for notebooks with super-fast processors, large displays and advanced multimedia features. It's not the ideal solution, as it's not integrated into the notebook and adds another cable and a couple of pounds of weight, but it shows where battery technology will eventually take us.

And finally, there's Microsoft's Windows 2000, which promises to "mobilize the enterprise." This significant upgrade of Windows NT 4.0 offers a lot of mobile features including better device support, improved docking and undocking capabilities, higher levels of security, more remote manageability, better communications, added synchronization and the latest in power management.

Getting a Grip on Handhelds

Although not as powerful or flexible as notebook PCs, handheld computers are coming on strong as a second line of defense for e-mail and quick connections to the enterprise. The ubiquitous Palm Pilot has undeniably evolved to become a standard tool in the mobile executive's suite of products. Although it has only been around for about five years, the Palm has quickly become as indispensable as a cellular phone because of its ability to contain and organize basic name and address, schedule and task information.

In fact, it has achieved almost a cult-like following among road warriors. Presently, there are millions of Palm devices in use at all levels of the business enterprise, especially by remote workers in the field. The problem, however, is that while the Palm is useful as a personal information manager (PIM), it's still used for the most part as an automated Rolodex of sorts — primarily because it is in essence a disconnected island of information.

This situation has changed somewhat with the introduction last year of the Palm VII, which integrates a wireless modem and service via Palm.Net with the functions of a standard Palm device. Flip up the built-in antenna and you can retrieve e-mail, or browse clipped Web pages through such content pushing services as AvantGo. The problem, however, is that using the Palm VII requires adding yet another e-mail address since the device works through Palm's proprietary network; and most enterprises are hesitant to funnel potentially sensitive e-mail through

Portsmith's Portsmith Express port replicator offers a single-cable USB connection to Windows 98 and Windows 2000 laptop users.

Electrofuel's PowerPad 160 provides 16 hours of extra battery power to certain models of notebooks.

Konexx solutions will make your road warriors even *more* mobile.

One of the reasons Big 5 accounting firms

Because Konexx saves time and money by providing high performance modem connections at virtually any job site where wire ess ca

third-party Internet services like Visto.com, which act as message depositories for devices like the Palm VII.

In late May, Palm announced a version of its synchronization software that is compatible with Windows NT. It will transfer applications, data management and control to IT departments. The Palm HotSync server software offers centralized data backup and restoration, application deployment, configuration and usage tracking — all areas of key interest to enterprise users wrestling with handhelds being used throughout an organization.

It's all in the Pocket

Palm is not the only game in town. Earlier this year, Microsoft unveiled a new version of its WinCE operating system, called Pocket PC. While this new operating environment borrows heavily from the previous version, it has been optimized and trimmed for the consumer and business markets. WinCE attempted to be all things to all people and applications. Pocket PC narrows the focus of the handheld environment down to a handful of key applications. Plans are to initially target the consumer market, although Microsoft and three of the four vendors initially tapped to build Pocket PC devices (Hewlett Packard Co., Compaq and Symbol Technologies Inc.) have their sights on enterprise applications.

Mobile Insights predicts Pocket PC will ultimately capture at least 23% of the PDA market by 2003. Most of this will come from the consumer space, since it is an area where Palm does not seem to have a strong hold and Microsoft has packed in games, multimedia and other capabilities that would appeal to a consumer user.

Some of the Key Features of Pocket PC Include:

- The Microsoft Reader and first use of its ClearType technology to significantly improve screen legibility and allow the devices to be used for reading electronic books.
- Support for Microsoft's Media Player and MP3 digital music formats, which allows users to download music from the Internet.
- A full version of the Pocket Internet Explorer, a huge improvement over the "Web clipping" technologies adopted by Palm for use on its Palm VII and wireless-enabled Palm V devices.

What is most exciting about the Pocket PC is the wide range of planned activities and development by third-party partners that focus on the particular needs of the enterprise user. For example, SAP AG has developed enterprise resource planning (ERP) applications that are compatible with its MySAP suite of products. An early user is Husky Oil, one of Canada's largest refineries. Symbol Technologies is also working on plug-in scanners that would transform Pocket PC systems into portable point-of-sale terminals for mobile e-commerce applications. Microsoft also has plans to port SQL Server to the operating system and allow developers to build applications that can be used to do such things as track inventory or offer mobile e-commerce capabilities.

Bsquare Corp. has developed an instant messaging application, compatible with MSN Mobile services, that targets enterprise users as well as consumers. The Bsquare Messenger 1.1 is designed to instantly connect users of Pocket PC devices to friends and business associates — a variation of the local communications strategy Nextel Communications took with cell phones. The software

Palm Inc.'s handheld device, the Palm V Organizer.

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It's never been faster or easier to explore and exploit the possibilities of exciting new technology than with the [redacted] high-return Wireless-to-Host technology from SEAGULL. [redacted] from the back office and see [redacted] www.seagullsw.com/muchmore.html or [redacted]

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works with everything from wireless LANs and wide area networks to mobile telephones with infrared ports. It's also reportedly one of the first applications to be compatible with Bluetooth wireless technology, designed to wirelessly connect printers, desktop computers and cellular telephones.

Modularity is another issue that is a key concern within the enterprise, since it allows a single device to be easily customized for different tasks within an organization. To address this need, Compaq has developed its iPAQ series of snap-on modules for its Pocket PC device. The company is also working with Bluetooth chip manufacturers like Socket Communications Inc to integrate PAN technology into these systems. Symbol Technologies is also extending its wireless scanning technologies to work with Pocket PC.

Casio Corp., another Pocket PC vendor, has developed a camera that plugs into the available slot on its device to capture digital images. It's primarily targeted at consumers, and has applications potential in the insurance, real estate and medical fields to create visual as well as audio and text-based records.

Solutions are also coming along that easily transform handhelds like the Palm into truly wireless and mobile workstations. In early May, for example, OmniSky Corp. unveiled a service that combines a CDPD wireless modem with a group of news, information and e-mail services that can provide a mobile conduit for critical business data.

Wired and Ready

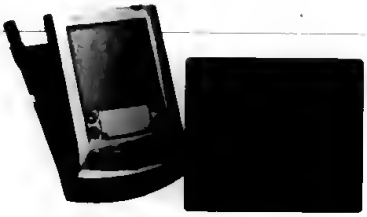
One of the biggest trends in wireless today is an "always on" communications capability, which allows instant and almost real-time access to e-mail, news services, and information "pushed" by Net publishers or corporations. This benefits the user because he never has to remember to synchronize a device with a remote system, or continually log on to a communications service or ISP to collect messages.

OmniSky Corp. is one company that has adopted this strategy in the development of a service that brings together a wireless modem developed by Novatel Wireless, a sleek Palm V, and software that allows users to access reformatted pages from the Internet (see story, page 14). Wireless CDPD communications services are hosted by AT&T, and cover more than 3,000 cities across the U.S.

The OmniSky package was actually released as part of a beta program late last year to about 1,000 users. Each paid $299 for the wireless modem and had unlimited wireless access in exchange for views, comments and suggestions for improvements. Based on feedback from these first adopters, the OmniSky service was improved to include a more intuitive user interface, an improved installer and the elimination of some early applications like a built-in program launcher.

Basically, the OmniSky package allows users to access and navigate the Internet, send and receive e-mail from their existing accounts and easily click on various news and information services. OmniSky claims to offer at least 1,000 different news and content feeds that have been optimized for the Palm viewing platform, including *The Wall Street Journal Interactive Edition*, *BusinessWeek*, Travelocity and various financial brokerages.

OmniSky uses Aether Software's ScoutWeb server technology to translate Web content into a form that is read-



OmniSky for the Palm V platform allows users to access and navigate the Internet.

able on a handheld device. ScoutWeb software's "create-once-delivet-everywhere" apptoach dynamically transcodes HTML content for display on HTML-based or Wireless Markup Language (WML)-based handheld devices using any handheld device bmwser, including the Palm Web Clipping Browser, Pocket Internet Explorer and Witeless Application Protocol (WAP)-enabled smart phones. Users can select their menu of wireless information services by logging onto AvantGo.com and clicking on those services you want installed on your wireless Palm. Using OmniSky, you can even dabble in e-commerce through a numbet of partnet companies. OmniSky has inked agreements with more than 150 popular Web-based businesses to include optimized access to theit sites. These include Barnes&Noble.com, Ticketmaster Online and others.

One of the biggast trends in wiraless today is an "always on" communications capability, which allows instant and almost real-tima access to electronic mail, news services, and information "pushed" by Net publishers.

The OmniSky package — which costs about $39.95 pet month fot unlimited wireless access — can also be used to pull cotporate e-mail from a Microsoft Exchange server or Post Office Protocol 3 (POP3) e-mail accounts. Since the service is cellular based, it is relatively secure.

The rechargeable modem has mughly a 10-hour lifespan (depending on operation) so it can be left on all day and will signal the uset with a small red light on the front of the modem when a message arrives — a terrific timesaver when running between gates at airports ot driving to your next appointment.

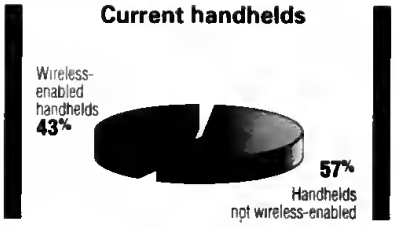
Just recently, OmniSky announced a joint venture with News Corp., one of the world's largest media companies, to explore international opportunities for wireless Internet services. If it flies, the venrure will extend OmniSky's services globally and expand the availability of bigh-speed wireless Internet access, content and e-commerce.

Glenayre Technologies Inc. has its eye on pervasive and persistent wireless connectivity. The company has a 35-year history in personal communications systems, most recently developing a series of two-way interactive pagers. It has now extended that technology by developing a two-way wireless messaging module for the Handspring Visor handheld computer system. The @ctiveLink module, which started shipping in July, plugs into the Springboard slot of the Handspring to allow wireless-enabled Palm OS applications to tap into resources on the Internet or corporate data resources.

In an effort to build a wireless applications base, Glenayre has created an @ctiveLink software development kit, which can be used to create a range of horizontal and vertical solutions. These include applications in healthcare, the insurance industry, on-line banking and other segments. The kit includes built-in encryption technology, developed by Certicom Corp., to protect the sensitive nature of this data. Wireless applications being shipped with the system include a messaging platform that can be used to access Internet-based e-mail, a wireless-enabled address and datebook and a client application that supports Microsoft Outlook.

One of the key features of @ctiveLink is that the mod-

Handspring's Visor supports Glenayre Technologies' two-way wireless messaging.



ule continues to collect messages and audibly and visually alerts the user even if it is unplugged from the Handspring host. When the unit is reinserted, messages are instantly downloaded to the handheld computer, and can be routed to particular applications installed on the device.

Wireless pagers have long been a mainstay of the mobile community, primarily because they are small, simple, reliable and highly cost-effective. In fact, many cell phone users rely on alpha-numeric and two-way pagers as the first-line of defense against high cellular service costs since they can be used to screen brief message bursts and limit expensive airtime. Digital cell phones and WAP phones can receive paged messages via the Internet, so pagers have evolved to be able to handle e-mail and offer basic PIM functionality.

Research in Motion, Inc. has developed a number of messaging systems designed to be unobtrusive yet "always on" for the active professional.

The most popular is the RIM 850 Wireless Handheld, a rugged, little powerhouse that is based on an Intel processor, has 2M bytes of flash memory, a six- or eight-line LCD display, a tiny keyboard and a scrolling wheel to select system functions. PIM functions include an address book, calendar, tasks alert, calculator and memo pad. These can be synchronized with a desktop PC version of the software and a docking cradle that plugs into the host computer's serial port.

The small unit, which can be clipped to a belt, is presently packaged with a variety of on-line services. One of these is the eLink Messenger service offered by American Mobile Satellite Corp. This system is an independent e-mail service, which means you will need a separate e-mail address. However, most e-mail systems and servers (including Lotus Notes) can be configured to automatically forward messages to a mobile user's RIM 850 Wireless Handheld and unique e-mail address. American Mobile also offers an eLink Agent edition that sits on a host server and can be set up to automatically route current e-mail traffic to the RIM 850 Wireless Handheld.

Research in Motion also offers a communications technology, called BlackBerry which is bundled into the RIM 850 Wireless Handheld. The benefit of this technology is that it does not require a new e-mail address and is totally compatible with Microsoft Outlook and Exchange Server. Messages (2K bytes automatically, with the option for more) received on a host PC or Microsoft Exchange Server can be programmed to be automatically forwarded back through a firewall and the Internet, over a wireless network to a user's BlackBerry unit, minus any large attachments. Likewise, users can reply to these messages back through the wireless network, over the Internet and back to the server and host PC. It's all very fast, secure and efficient.

Service plans for both American Mobile and BlackBerry range from about $25 to $40 per month, plus the $399 cost for the RIM 850 Wireless Handheld. One Inter-

Research in Motion Inc.'s RIM Wireless Handheld, RIM 957 Wireless Handheld and the BlackBerry interface

net Service Provider, RCN Communications, offers BlackBerry support for sending and receiving e-mail

Spurred by the success and initial excitement created by BlackBetry, RIM decided to extend the BlackBerry family with a series of devices that borrow from the popular Palm form factor, but employ the BlackBerry communications scheme to offer that "always on" witeless capability not available in the Palm VII. Since the RIM 957 Wireless Handheld also offers a larger viewing screen, full PIM functions and does not tequire a separate clip-on modem, it may also eliminate a lot of extra devices banging around in the average executive's briefcase. The system measures 4.6-in. x 3.1-in. x 0.70-in., and weighs less than 5.3 ounces. It boasts a high-quality 16-line ot 20-line LCD screen, a 32-bit Intel 386 processor, 512K bytes of SRAM, 5M bytes of Intel flash memory, a highly usable (but small) keyboard and track wheel and an embedded wireless modem.

Like the vetetan RIM 850 Wireless Handheld, it has an integrated organizer (including a calendar, address book, task list, memo pad, calculatot and alarm) and full support for the award-winning BlackBerry witeless e-mail solution. The total package also includes a docking cradle and Puma Technology's Intellisync software — all for $499.

Convergence Down (and On) the Road

To get some idea of where all this mobile and wireless development is headed, you might turn to an old and classic song by The Beatles. In effect, everything is "coming together" as different yet symbiotic techoologies converge.

Motorola Inc. has already developed a device that merges a digital cellular phone, PDA and mini-Internet appliance called Accompli. The small system, which resembles a clamshell-type cell phone but with a larger LCD screen, has a fully integrated PIM, wireless calendar and contact applications, a WAP browser and instant messaging capability. The device can also be expanded with a clip-on wireless camera developed in cooperation with LightSurf that allows you to shoot pictutes docked or undocked. Pictures can then be sent and stored on the Internet, eliminating the need for flash storage cards.

Advances are also being made in automobile-based computing, more commonly known as telematics. Right now, there ate up to 80 microptocessors in the most advanced automobiles. However, that number will increase to 100 or more in the next two or three years as car companies install computer-controlled diagnostic systems, optical cables and a variety of "info-tainment" devices. Among these will be real-time Global Positioning System, which can be used to direct you step-by-step to your destination; and voice-enabled Web browsing systems, to retrieve e-mail and provide data that is relevant to your geographic position. A sales force, for example, can use such a system to automatically access information that relates to a client, and then instantly transfer that data to a handheld computer ot tablet via an on-board Bluetooth communications system.

Motorola is already working with car companies like BMW, Mercedes-Benz and General Motors to integrate these types of systems into their automobiles. IBM has also demonstrated voice-enabled telematic systems that not only flag you when there is a problem with your engine, but tell you where you can get the best price and fastest service to fix the problem and get you back on the road. ■

Q&A

An Interview with Novatel Wireless

When OmniSky Corp. was seeking a partner to help spread the availability of wireless Internet access, the Palo Alto, Calif.-based startup didn't hesitate. "As the first company to bring wireless Internet access to the Palm organizers, Novatel Wireless was an obvious choice," says Barak Berkowitz, OmniSky's president.

"Novatel was designing a wireless modem specifically for Palm Inc.'s Palm V. They were way out front. We saw an opportunity and knew we could leverage it with the right kind of strategic plan," adds Jim Obot, OmniSky's senior vice-president of operations.

OmniSky brings simplicity and ease of use to a field that many consumers have previously found intimidating. "By combining OmniSky's expertise in content delivery, software and networking with Novatel Wireless' expertise in wireless modem technology," Berkowitz says, "we are that much closer to our goal of making ubiquitous wireless Internet access a reality."

Natural Market Opportunity

The companies spotted a natural market opportunity. And quite a market opportunity it is. Experts predict that in 2004, as many as 400 million people will use wireless devices to access the Internet. And the Yankee Group, a Boston-based research firm, has predicted the wireless data market will grow from $1.8 billion last year to $13.2 billion in 2003. The wireless Internet market is distinctly global in nature, too. A recent study from research firm Ovum sees 484 million wireless users worldwide by 2005, with over 171 million in Europe and 159 million in Asia/Pacific and Central Asia.

OmniSky differentiates itself from competitors by offering one-stop wireless shopping – billing, content, support and integration, all bundled together. The service is available for the Palm platform now; OmniSky plans eventually to branch out to Microsoft Corp.'s Windows CE (Pocket PC) devices, pagers, and wireless application protocol (WAP)-enabled phones.

Headquartered in San Diego, Novatel Wireless Inc. develops wireless Internet solutions for both fixed and mobile environments. With a full line of products including Merlin wireless PC cards, Minstrel wireless palmtop modems, Sage wireless serial modems, Lancer 3-watt modems and Expedite wireless OEM modules, the company is recognized as a leader in the exploding field of wireless Internet connection.

Thus, a Novatel Wireless/OmniSky partnership looked like a natural fit. And it has already borne fruit. Novatel Wireless recently rolled out the OmniSky Minstrel V wireless modem, a modem cradle for Palm devices. The Minstrel V has been called a breakthrough product, combining seamless wireless Net access and a sleek design.

The custom-developed wireless modem cradles will use Cellular Digital Packet Data (CDPD), a packet data protocol designed to work over the original cellular network.

The OmniSky Minstrel V supports POP-3 e-mail, Palm Query applications, Internet channels and native Web access with flat-rate wireless network coverage.

Effortless Usability

Ease of use and simplicity are two major goals of the project. OmniSky boasts large numbers of employees who used to work for companies specializing in user interfaces, ease of use and general consumer-friendliness. "We have quite a legacy here of folks from Palm and Apple," says Scott Briggs, director of operations at OmniSky. "We have a real focus on bringing that kind of ease of use to the wireless Internet access arena."

Simplicity is the key. OmniSky provisions wireless modems, preconfiguring them in "the things the average consumer is not going to be comfortable with," Briggs says. Such potentially intimidating tasks include registering the device on a network, configuring an Internet Protocol address – "Making it simple to open the box and start using it," Briggs says.

The OmniSky user interface continues the ease-of-use theme. "We've built a portal page that lets the consumer move from one homepage to any activity," Obot says. From this single launch point, a user can open a browser, his or her e-mail, a Yellow Pages telephone directory and any number of other tools. Moreover, Obot points out, OmniSky optimizes content by subject – so all financial content, for instance, can be found under one tab. This easy navigation is a popular feature with both experienced users and neophytes.

Looking to the Future

So how's the Novatel Wireless/OmniSky team doing? Great, as far as OmniSky is concerned. "The partnership is working as well as we could ever have hoped," Obot says. "We hope to continue to work with Novatel on other opportunities as they arise. We're bringing broader access to the web." ■

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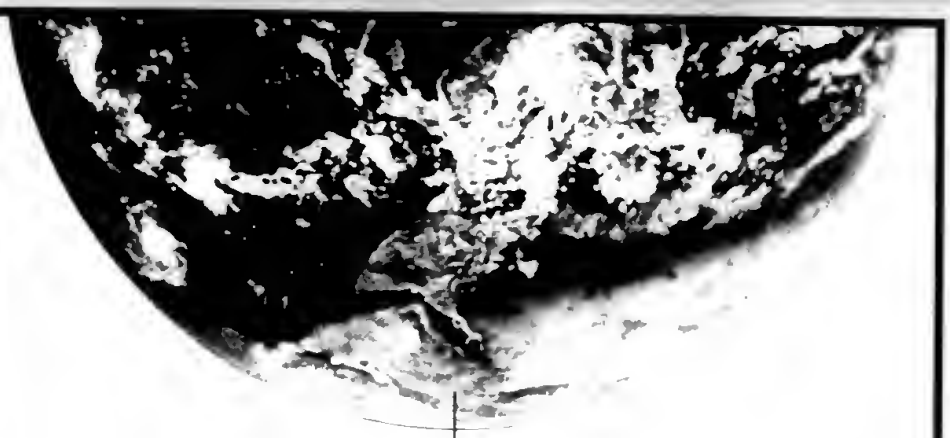

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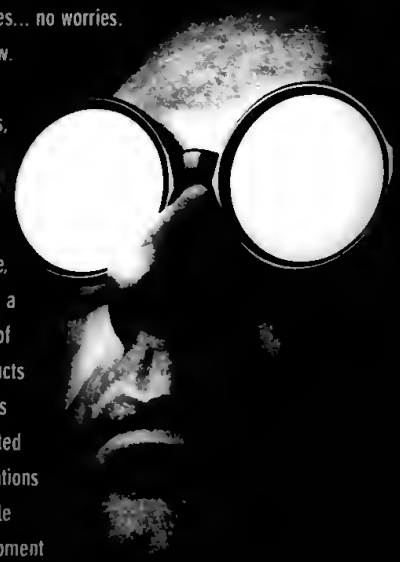

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1. AMD (see example)

2. Athlon

3. processor

4. now

5. with

6. full-speed

7. performance

8. enhancing

9. cache

10. memory

Premier 100 Panelist: Security a Drill in Risk Management

Gregory Schaffer is a director in the digital risk management and forensics investigations practice at PricewaterhouseCoopers. At *Computerworld*'s Premiere 100 event last week in Palm Desert, Calif., he shared his thoughts on information technology security during a panel titled "Enterprise Security: Will Only the Paranoid Survive?" He later spoke with reporter Ann Harrison.

Q: Why do so many businesses have weak IT security systems?

A: Network security can be a horribly complex problem that is not easily solved by simply implementing some off-the-shelf system. It's not just a matter of installing a virus checker or intrusion detection software or a firewall; that is not enough.

SCHAFFER

Even the most straightforward solutions available need to be monitored and maintained and patched on a regular basis to be effective. Ultimately organizations need to look at their own risk management issues and decide what level of vulnerability they can afford. They often will prefer to spend money on something that drives sales and make security a secondary priority, but with the "I Love You" virus, the tables are starting to turn because the damage levels are starting to rise to the point where security concerns can no longer be taken lightly.

Q: Are many companies vulnerable because they fail to patch known holes?

A: Staying abreast of security vulnerabilities and applying appropriate countermeasures is increasingly difficult as systems become more complex and as merger activities require the combinations of systems that were never intended to be linked to one another. New technologies are implemented almost in real time as they become available, and it takes time for security issues to bubble up to the surface and be really addressed. While it's hard for full-time security professionals to keep up with everything, it's really hard for someone who is tasked with maintaining a network and tasked with doing the security piece at the same time.

Q: Should companies seriously consider outsourcing their security management?

A: There are definitely advantages to having people who are security professionals handle security. It is a complicated task, and so it is easier for a security professional that can make these issues the focus of his or her business. It behooves them to be up-to-date and follow the latest trends, not as a distraction from, say, a sales goal, but as a core focus.

Q: Some companies are moving their security divisions to auditing departments. Is this a good idea?

A: In some instances, it is a matter of clout and a way to give security folks greater influence over operations. In the IT section, they are sometimes not seen as core to the function of the business, and therefore, they can have their budget highjacked and have resources deployed in ways that are not necessarily moving the security ball. . . . But ultimately it is not a question of where you put your security functions, it is making sure that they are incorporated into the business operations and not added as an afterthought. It is also very hard to implement any rational security policy without making an assessment of what your assets are and which assets are most important to the operation.

Q: Insurance companies are beginning to conduct security assessments before writing policies. What are your thoughts on this emerging trend?

A: I think these are early steps toward the development of a standard set of security requirements. But we are a long way from any universal standard. These networks are so diverse and complex that it would be almost impossible to designate a commercially viable security standard unless it was very general and could be applied across the board. But there is definitely a move . . . toward the development of at least a checklist of security measures that should be implemented over time.

Q: What might that checklist include? Should intrusion detection, monitoring, firewalls or antivirus systems be on that list?

A: One thing you have to keep in mind is that this is an exercise in risk management. It depends on what the business is, what the risks are, the things that you are trying to protect and what the downside is if you have certain kinds of incidents. You have to have a system that addresses your risk and does not hamper business so much that the cost of security is shutting the business down.

Q: Attorney General Janet Reno has called on companies to share more information with government agencies and law enforcement when they become the victims of computer crimes. What motivation would companies have to do this?

A: The truth is that the government has gotten much better in the last several years at tracking and capturing the hackers. What we need to deal with as a society is that the hackers have a mentality that no one will ever see what they do. And if they are seen, they believe no one will ever figure out how to catch them. And if they are caught, they believe they won't really be punished. And if they are punished, they write a book about it, become a security expert, and make a million bucks. As a society it is important to say this is not something that we approve of or something that 15-year-old should aspire to.

In the long run it would be helpful if there was more reporting of instances so that as a society we can better assess the true costs of hacking and allocate appropriate resources to address the problem. ▶

WORKSTYLES

What It's Like to Work at . . . The Pillsbury Co.

Interviewee: Leo Timmons, senior manager for e-business in the development technologies group
Company: The Pillsbury Co
Main location: A few blocks from the Mississippi River in downtown Minneapolis
Tenure: 20 years
Number of IT employees: 13 on the e-business staff; 500 in information management
Number of employees (end users): 17,000
Major e-business initiatives: Managing 24 public Web sites, such as Greengiant.com and Haagendazs.com; maintaining the corporate intranet; managing the company's business-to-business Web sites; participating in a number of industry-oriented Internet marketplaces, and training LAN administrators to administer their portions of the Web sites.
E-business training: Microsoft seminars, training events and industry conferences.
Dress code: "Business casual – mainly khakis and polos, but some people do wear jeans."
Workday: "We have flextime, so some come as early as 6 a.m. and others between 9 and 10 a.m. We also have flexible summer hours, so if it's sunny on a Friday afternoon, everyone usually clears out after lunch."
What's unique about working in the grocery manufacturing industry? "We get to eat good food all the time."
In-house cafeteria? Yes. "We have multiple buildings, and each building has at least one. They feature Pillsbury products and other things."
Rating (scale of 1 to 10, with 10 the best): 7
IT career path options: "There's a technical career track, so you don't have to switch into management if you don't want to." Also, a college internship program leads to permanent hires.
Bonus programs: There's an annual bonus based on corporate performance, as well as an employee stock-purchase plan. "We also can give each other recognition awards, like a free dinner out or other small gift."
Kind of offices: "In my department, we all have our own offices. If you're a consultant or an intern, you share a cube in a bullpen area."
Best feature: "We're up on the 35th floor of an office tower and we have floor-to-ceiling windows, so we have spectacular views of the river and the rest of Minneapolis. I used to work the graveyard shift, and it would be amazing every day to watch the sun come up."
Office mascot: The Pillsbury Doughboy

What is it like working at a company with so many recognizable brands? "It instills pride. They say that the Pillsbury Doughboy and the Jolly Green Giant are in the same psychic landscape as Santa Claus."
Must people carry beepers? Cell phones? "I carry a beeper but my staff doesn't. . . . We have a 24-hour data center that's always monitoring the sites so they can fix problems without our intervention."
Number of IT staffers who telecommute: One person on the e-business team
On-site day care? No, but the company provides day care spending accounts that allow employees to put aside $4,500 pretax dollars per year for child care, and the company matches the first $500. Pillsbury also offers a 30-day paid paternity leave for births and adoptions
Little perks: Box seats at local sporting events, company merchandise "at good prices," company volleyball tournaments and discount tickets on movies, the state fair and "Pillsbury Nights" at baseball games or amusement parks.
Would employees feel comfortable e-mailing the CEO? "I think so. I've sent him a few messages, like stats on Internet usage, and he writes back. Once he sent me an e-mail with an attached 8-by-10 photo of my son and me that he took at a company softball game. We do periodic online chats with senior management, and there's also an 800 number where you can leave anonymous messages."

– Leslie Goff (lgoff@ix.netcom.com)

JIM CHAMPY

A deadly new game

REMEMBER THAT 1975 movie *Rollerball* starring James Caan? It featured a game in which some players wound up dead. A game just as rough and potentially just as painful is about to erupt between some information technology companies and traditional businesses. I call it "ultimate disintermediation."

During the past several weeks, capital markets have knocked down the supports, the very underpinnings, of hundreds, perhaps thousands, of e-commerce businesses.

Investors and managers alike are now forced to face the possibility that a pure e-commerce business will never be profitable. Even the value of many of the so-called business-to-business models (which the experts earlier this year advised you to put your money into) is now being questioned.

But there's an encouraging side. Companies relying on e-commerce must prove the viability of their business models before venture capitalists will consider opening their checkbooks. This is good discipline — it will lead to the creation of more viable companies.

But this new discipline will also bring to the forefront another question: Will all those new digital marketplaces be disintermediated, in turn, by the newest products of IT companies?

The threat to businesses from IT comes from the prospect of powerful universal search engines. They will guide users to Web sites and sift through all the options.

Why should companies like Ford, GM and DaimlerChrysler go through all the effort and expense of building a digital marketplace for purchasing parts or selling automobiles when a universal search engine will be able to sort through Web-based inventories and catalogs to find what a buyer wants?

Then there's the consumer side. Why should any major shopping site, like an Amazon, add more products and services when a buyer, with a mere click or two, can search across several e-retailers for a book at the lowest price?

Will those same IT companies, whose technology made digital marketplaces and electronic shopping sites possible, go one step further, seeking to dominate commerce with powerful search capabilities? I see rising tensions and conflicts on the horizon.

Will digital marketplaces be able to compete with more generic shopping sites? Yes, but only if they offer a value even greater than best price. There are at least three ways that digital marketplaces can create additional value.

The first, service, should come as no surprise. But how can a company build a service capability at the lowest cost that price pressures will require? Here's where brick-and-mortar companies moving into e-commerce may have an advantage over dot-com start-ups. Most of the brick-and-mortars already have efficient service and logistics capabilities.

Second is content. Particularly in business-to-business marketplaces, variety and availability are critical to attracting and keeping customers. Marketplaces that are created by companies with complementary products, like W. W. Grainger's Orderzone (*www.orderzone.com*), have the best growth outlook. At Orderzone, you can shop for nuts and bolts, office supplies and lab equipment — almost everything you need to run a plant.

Technology has threatened business as it was once run.

Third, electronic marketplaces must deliver superior processes to their customers to achieve sustainable value and competitiveness. Those processes must include everything from requests for quotations to product inquiries to order fulfillment. And by executing these processes well, electronic marketplaces can dramatically reduce a buyer's operating costs.

By making traditional business models obsolete, technology has threatened business as it was once run. Consider the difference between retail banking operations 10 years ago and today.

I haven't yet seen IT companies become direct competitors to the businesses they have empowered. But companies that build sophisticated electronic channels may well compete with those businesses.

In the game of ultimate disintermediation, the winners will be IT companies or markets that in the end create more value for customers. I'm still betting on the markets.

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net.

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How do you fund often-expensive e-commerce projects? Financing them poses unique challenges. Do you get the money from internal project budgets, or spin off the company and seek venture capital? Sometimes the options are simpler than you might think. By Maria Trombly

FUNDING AN E-COMMERCE PROJECT is much like funding any other project, according to David Duryea, a consultant at Conley, Canitano & Associates Inc., a Cleveland-based company specializing in eoterprise resource managemeot and Web strategy.

A company's options include paying the cost out of cash flow, taking out a bank loan or selling bonds or stocks.

It often makes sense to spin off an e-commerce venture as a separate company to make it more attractive to investors. The converse can also take place — the e-commerce project can transform the entire company, changing its business models, revenue streams, customer base and supply chain.

Duryea has just finished a project for the third-largest egg producer in the country, helping to turn it into an e-commerce company by spinning off the divisioo that sells egg yolks in bulk to restaurants.

Scrambling for Cash

But before the company could decide how to pay for the project, it had to figure out how it would structure the new business.

If the online business is spun off, theo it can go after the same sources of funding as all Internet start-ups — banks, investmeot bankers and/or veoture capitalists.

Before the stock market turned bearish, there was "plenty of money out there," says Duryea. "But I also think that we've had eoough correction out there. We'll see it perk up again. The amount of growth that can be made by going to the Ioternet is substantial, and that attracts a lot of investors."

Once a company decides to spio off an e-commerce project into a separate company, the next step is to produce a business plan and calculate the expected return on investment.

"It's back to the fundamentals," Duryea says. "The technology enables you to do things you haven't dooe before, hut the basics don't change."

Duryea has seen e-commerce companies spin off and become operational io as little as three mooths.

"It's easier to start a company from scratch than to reinvent a company," he says. "There's so much baggage out there."

If a company deeides to keep the e-commerce

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project in-house, theo a different set of issues comes up.

Here, funding may be slightly easier than for other major initiatives. However, some managers need to be educated about how e-commerce efforts differ from traditional business projects.

"There's a different reality," says Richard Wise, vice president and director of e-commerce at Mercer Management Consulting in Lexington, Mass. "Manufacturing plants, for example, can take 30 years or so to pay back. So a lot of managers are in traditional businesses where the investment picture looks like this: I dig a deep hole and slowly climb back out of it."

Because the initial investment in an e-commerce project can be high and the payout period can be long — and because it's extremely expensive, if not impossible, to change strategies mid-course — managers teod to be very conservative and conduct a great deal of planning and analysis before they give the go-ahead, Wise says.

"But with e-commerce, you can build the service incrementally and you can dynamically reconfigure the business as you go," be says. "Senior management doesn't often realize that they have this flexibility."

Financing the Project

There are three major means of internal financing, Duryea says: internal cash flow, debt and selling shares.

"The best way to finance something is internal cash flow," he says. "It's the cheapest way around. If you issue more shares, it dilutes the shares and the earnings per share. If you go after debt, that's interest charged right off tbe bottom line. But if a company focuses oo growth and becomes its own bank, that's the cheapest way to go."

Duryea suggests that a company with a maturing product dedicate some of its profit to research and development, with some of the capital targeted toward investing in new market growth.

"To me, an investment in e-commerce systems is not different than an investment in any other corporate asset," says Jeffrey Lockenvitz, who is informatioo technology controller at United Parcel Service of America Inc. in Atlanta.

Almost all companies fund their e-commerce projects through cash flow, at least initially, says Tim Newington, vice president of equity research at Credit Suisse First Boston Corp. Later, they may go to capital markets for additional financing.

In addition, e-commerce projects don't necessarily have to hurt the company's stock price, says Newington.

"You have to look at their potential," be says. "If there's a high expected return oo investments, then the investors will support it."

But because e-commerce expenses are structured differently than traditional capital expenses — there are no manufacturing plants to depreciate over 30 years, for example — it may make sense to set up a tracking stock or spin off the business, says Newington. That way, it's clear that the money is being spent for a nontraditional project.

Taking on additional debt is the least appealing way to go for most companies — e-commerce projects rarely geoerate immediate returns, but the debt service payments must be made.

"It all depends on how much you want to spend oo interest vs. how much you want to put into investmeots," Duryea says.

He adds that after cash flow, his preferred source of funding is the stock market.

"You can raise the capital but not have the debt expense that you have to pay every month," says Duryea.

- Is there a market for the e-commerce product? Is it viable?
- How is the e-commerce company positioned in its chosen market? Is there market leadership?
- How good is management? Do the executives have successful records?

Cash flow:
- Using the money that a company's operations generate is the best option, provided that money is available and investors can be convinced that the spending is worth it. That's where a tracking stock can help.

Equity:
- Issuing stock dilutes the worth of existing shares for publicly held companies, but the money doesn't have to be paid back.

Loans or bonds:
- Taking out a loan or selling bonds can be a good alternative if money is expected to come in either from a stock sale or profit. But it can be risky, especially for an e-commerce venture. The debt payments still have to be made even if adequate revenue doesn't come in.

If speed is an issue and there's not enough ready cash to pay for a project, then short-term debt could be a good idea, he says.

"You'd have to go to the banks to borrow the short-term debt on the premise that you're going to raise the capital and replace that short-term debt with either venture capital, a second issuing, bonds or something like that," says Duryea.

But a better alternative, he says, is to stagger project rollouts to reduce the amount of up-front money needed.

"What I would do is take the products that are the easiest to be sold, like products that are shrink-wrapped — CDs, books, things that can be packaged easily and quickly — and get a Web site up in 60 days to sell a prepackaged, limited set of products," says Duryea. "Then I'd be able to generate some cash flow from that and show investors that it is working and then ask for the rest of the capital."

According to Wise, the key to a successful e-commerce initiative or other major project is commitmeot from senior management. Sometimes, support from top brass can even overcome an apparent lack of financial resources.

"A lot of the funding for these projects is coming from senior executives' slush funds," Wise says.

"When you get the CEO oo board, no matter how tight the budget, you can find the seed money," be adds.

And the egg producer?

The company is already selling some frozen egg products online and it decided to spin off its e-commerce venture as a separate company sometime next year, says Duryea. The $500,000 launch was paid for partly out of cash flow and partly with bank loans.

"Now, they can sell to all the restaurant chains that are all over the country and get access to them over the Internet," Duryea says.

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Million-Dollar Questions

Tim Newington, vice president of equity research at Credit Suisse First Boston's technology group, suggests the following criteria for e-commerce funding:

- Is there a market for the e-commerce product? Is it viable?
- How is the e-commerce company positioned in its chosen market? Is there market leadership?
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Financing Options

Companies can choose from the following three options to fund e-commerce investments:

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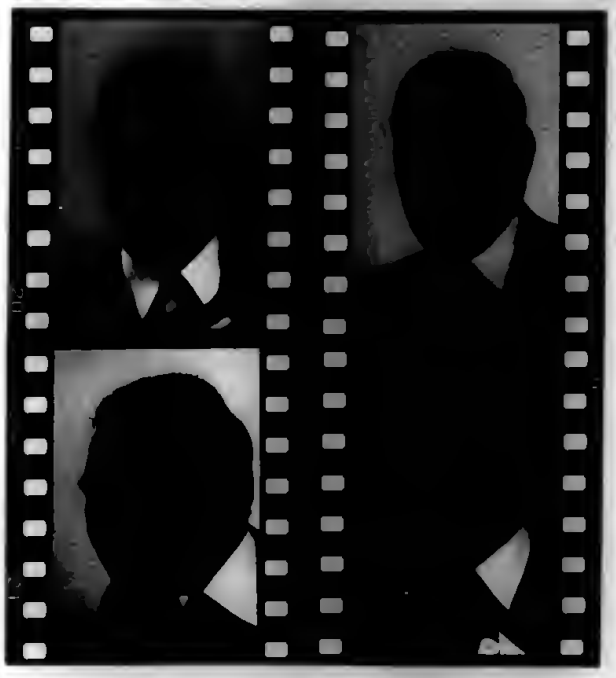
But it's not.

For co-CEO David Pottruck and Charles Schwab & Co., reinvention is the key to growth. By Kathleen Melymuka

TAKING STOCK



AS A TALENTED LINEBACKER at the University of Pennsylvania in the late '60s, Dave Pottruck was badly disappointed when the NFL draft passed him by, leading him to decide that he hadn't worked hard enough. Pottruck was determined never again to fail from insufficient effort.

By the age of 25 he had mapped out his career goals for the next 25 years. Then he achieved them — at Citibank, Shearson/American Express Co. and Charles Schwab & Co. "Nobody I ever saw worked harder than I did," he says.

But success had a dark side. "The price I paid was two failed marriages, underinvestment in time and energy in my family and being, in many cases, a fairly one-dimensional person," he acknowledges.

Ultimately, Pottruck's single-mindedness threatened his career. When he was head of marketing at Schwab back in the '80s, then-president Larry Stupski told him he was "too persuasive." Determined to win at all costs, Pottruck often bulldozed his way through colleagues' misgivings, rather than giving their opinions more consideration.

Looking back, Pottruck, who has been Schwab's president since 1992 and co-CEO since 1998, says he was "too competitive; too driven, making everybody around me feel uncomfortable; a person whom a lot of my colleagues found oftentimes unappealing."

So Pottruck began to reinvent himself, an effort he says is continuing. As the big man with the quiet voice talks unblushingly about character, integrity and generosity of spirit, one can imagine the amount of will it took for him to subdue the physically intimidating "John Wayne style of leadership" he says he once practiced. But Pottruck knew he had no choice. "The role of leadership will either bring out the best in you or take you down," he says.

Reinventing Schwab

Pottruck's focus on self-improvement makes him the perfect leader for Schwab, a company that has been using technology to reinvent itself since it was founded by its namesake in 1971, says CIO and Vice Chairwoman Dawn Lepore.

"If you're going to be leading a fast-paced company, you've got to be learning on the fly and reinventing the company," she explains. "And to reinvent the company, you have to reinvent yourself."

Since 1996, Schwab has been recasting itself as an Internet company on a brick-and-mortar base that includes more than 350 branches. "Schwab is writing the book" on Internet integration, says John Payne, a consultant at Cerulli Associates Inc., a Boston-based research and consulting firm. "It has

Continued on page 69

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A VALIDATION OF QUALITY

Microsoft's Certified for Windows 2000 applications are designed to take advantage of all the enterprise-focused features of the underlying Windows 2000 operating system: Active Directory, a key element in helping to reduce administrative costs; standard install/uninstall procedures; user interface settings; and Security Services. Certified Advanced Server applications must also support clustering—in other words, those applications must be able to fail over and restart on a second server without disconnecting their clients. And server applications with client components

must meet the requirements in the desktop Windows 2000 specification as well as the server specification. (For more information about the specification itself, read "Testing, Testing," a list of FAQs, on page 12.)

Certification is a "validation of quality," says Rob Enderle, vice president of desktop and mobile technology at Giga Information Group, Inc. in Santa Clara, Calif. "It provides a higher comfort level for customers and can give peace of mind."

GartnerGroup, of Stamford, Conn., agrees. In a research note, analysts Michael Silver and Michael Gartenberg wrote, "In creating a strong logo requirement, Microsoft has made the logo valuable to enterprises, which will be able to use the logo as a condition for an application's use in the enterprise." And in the April 17, 2000 issue, *InformationWeek*'s Aaron Ricadela said the certification requirements assure "IT departments that compliant software takes advantage of [Windows 2000's] remote software installation and system file protection features."

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The Customer's Choice

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CRAIG H. HARTLEY/MERCURY PICTURES

KUDOS FROM CUSTOMERS

Customers ranging from established players to emerging dot-coms have already found significant business value in the Certified for Windows program.

"The specification makes it more predictable when we do business with vendors," says Darren Marelia, technical director of NT architecture and planning at Charles Schwab & Co. in San Francisco. "A lot of effort goes into making applications work with our environment—where they put files, what kind of security to expect when they run, how they interact with the desktop. If we buy a piece of software that doesn't adhere to the spec, we have to go through it and bring it into our environment and up to our standards. The specification means we have to do a lot less work when we bring in an application."

Kennet Westby, CIO of CornerDrugstore.com, has also seen big benefits from certification. CornerDrugstore.com, based in New York, is uniting independent pharmacies across the United States, helping them build their own Web pages with customized inventory and customer support. "Family pharmacists that have earned the respect and trust of their local communities will now be able to service their neighborhoods over the Internet," Westby explains.

CornerDrugstore.com essentially bases its business on Pivotal Corp.'s eBusiness suite running on Windows 2000. Pivotal's eBusiness helps automate all facets of marketing, sales, and customer service relationships among partners, employees, and customers.

CornerDrugstore.com deployed Windows 2000 early last year, and went live with eBusiness in May. "Server certification was critical to making everything happen in Internet time," Westby says. "Pivotal's willingness to certify that all their applications and services would run in the Windows 2000 environment helped us make that choice," Westby says. "We didn't have to worry about it working." Because Windows 2000 was so new when CornerDrugstore.com was deciding which platform to use, the only other choice would have been to go with a different operating system and then switch after the fact.

"We didn't want to have to do that," Westby says. "It's difficult enough to get up and running as a business; the last thing you want is

to have to change your platform after the fact. Because of server certification, we didn't need to—everything worked as promised."

He says he's "absolutely thrilled" with Pivotal and Microsoft—his technology partners. "We've developed a very complex product in record time, and we're thrilled at the ability to offer this to our customers."

> It's difficult enough to get up and running in business; the last thing you want is to have to change your platform after the fact. Because of server certification, we didn't need to—everything worked as promised.
>
> CornerDrugstore.com's Kennet Westby

Schwab, CornerDrugstore.com, and many others have discovered the powerful business benefits of relying on server applications that are certified for Windows 2000. Paul Hill, senior programmer/analyst at the Massachusetts Institute of Technology in Cambridge, Mass. and someone who helped create the server specification, says simply that certified applications result in "software that actually works."

Certification is especially important on the server side, Hill says. "Being a nonprofit, we can't go out and hire hundreds of systems administrators to help run software that's poorly written. We need to distribute software to thousands of desktops without having to physically visit each of the desktops." Certified server applications allow MIT to maximize its IT resources. Because each of the applications really does work, Hill explains, the software can work with Active Directory to centrally configure information and then deliver it to end users' PCs.

Another huge benefit, Hill says, is the ability to administer certified applications without having to become subject-matter experts in the applications themselves. "If one of our departments goes out and buys software to do something, the IT group can administer it and be involved with data management without having to install the actual software," Hill explains. "It allows for an appropriate division of labor."

Seattle Mariners LAN administrator David Curry agrees. "Server certification is important; we believe in it. Non-certified applications don't take full advantage of Windows 2000—and you do get warnings when you go to install those non-certified applications."

SPEED AND EFFICIENCY: PRICELESS ASSETS

Among the business advantages customers buying certified applications have found—in addition to faster time to market, fewer hours spent chasing problems, and an overall improvement in the quality of server applications—are the following:

- A shorter learning curve when implementing the new operating system. Since many IT shops are still developing skill sets to allow them to maximize Windows 2000, using certified applications is a way to focus on the other things you need to learn—not on the applications themselves.
- Better use of your IT budget. In these days of record personnel shortages, you can apply your human resources to the places they're most needed.
- A shorter amount of time needed to test applications. Good IT managers will still do some testing, even of certified applications. But they will be able to do it in hours, not days.
- An overall smoother deployment of Windows 2000 and associated applications, with fewer problems and the confidence that what you're paying for will actually work correctly.

At the heart of all these benefits is the Application Specification for Windows 2000, with desktop and server components. Rich Clay, program manager at Microsoft, explains why Microsoft helped create the standard and the new logo program. "The prime criticism of the old logo program was that it didn't provide a high enough standard or the correct testing to be meaningful to the business customer. Microsoft's goal for Windows 2000 was to develop a specification in conjunction with our customers that contained requirements that really reflected what they needed and could be reasonably met by developers. In the end, we had a much higher standard test that made sure the software met that standard."

DEVELOPERS AGREE

Judging by those who have been there, the application certification test suite is daunting, but achievable. Peter Wagner, chief executive officer of the Damgaard Group in Copenhagen, says, "We set up a special team for this," with some 400 tests involved in the process.

Tom Kemp, vice president of marketing at NetIQ Corp. in Santa Clara, Calif., calls Certified for Windows "the most comprehensive software certification program in the industry that we're aware of." He bases this on the number of checkpoints in the tests and the time it took in the testing lab to

APPLICATION ON PATROL

BMC SOFTWARE | With certification for Windows 2000 Server, BMC's PATROL product is more predictable and reliable.

BMC Software's participation in the certification process has resulted in "a better product for the customer," says Greg Todd, program manager for Windows 2000 solutions.

BMC's product is PATROL for Microsoft Windows 2000 Server, and it provides a huge amount of systems-management functionality. Still in beta, it is scheduled to ship by the end of June 2000. The product is part of the PATROL 2000 product line, a broader integrated solution that enables the rapid deployment of advanced service level management. PATROL uniquely allows for automated diagnosis of the root cause of failures and prediction of the impact of business change on the quality of service delivered.

PATROL is geared to provide high availability and performance of the server. If something goes wrong—a server goes down or is being utilized to its maximum capacity—PATROL will alert the systems administrator via pager or console. But more than that, PATROL will take action to help correct the problem.

A lot of the new functionality in PATROL for Windows 2000 centers on Active Directory. PATROL delivers in-depth monitoring of Active Directory, a key part of the Windows 2000 architecture, ensuring that it's operating at optimum levels.

PATROL is, Todd says, "a well-behaved Windows 2000 application." This is, in large part, due to the certification process, he adds.

"When a customer installs PATROL, the files are laid down in the correct directory, there's standardization about how the start menus are placed, our agent is registered in Active Directory, and it follows the install/uninstall guideline," Todd explains. "Things aren't just lying around, causing problems later. The application won't be overwriting systems files and causing strange problems that nobody can find the cause of."

Todd believes the product is better—more predictable and reliable—because of the certification process. "The features are more in line with what Windows 2000 customers will expect," Todd explains. "A certified application like PATROL simply works better."

More information about PATROL can be found at www.bmc.com/patrol. ▲

make sure everything was okay. But, he says, the time and effort it took to certify NetIQ's system management software was well spent. "It all leads back to happier customers," Kemp explains.

Mike Garcia, senior product manager at VERITAS Software Corp. in Mountain View, Calif., whose Backup Exec disk utility has passed through the certification process, agrees that this program matters to enterprise customers. "We've gotten significant feedback from our customers that there's a distinct advantage when they know a product has earned the logo. They know they can buy and deploy with confidence, and that it will improve their chances of a successful rollout."

Roonj Uabhaibool, manager of worldwide networking services at PeopleSoft Inc. in Pleasanton, Calif., is a Windows 2000 user and a huge certification fan. "Sure it's important—you want to make sure everything works well together, is reliable, and really leverages the new operating system. Otherwise, what's the point of going with Windows 2000—why not just stay with the old platform?"

Well stated. ▲

FileNET Corp. | Certifying Panagon Content Services Server for Windows 2000 gives customers confidence

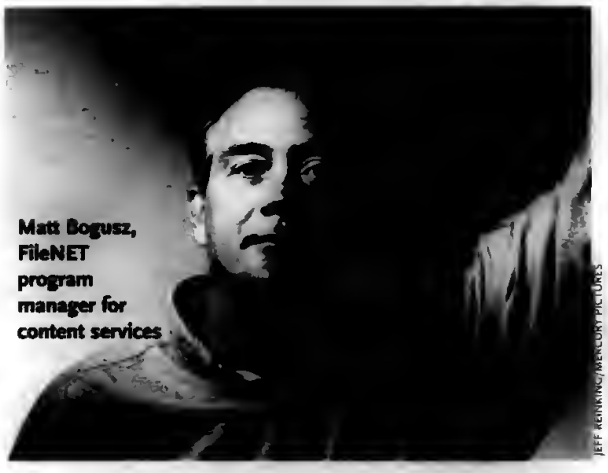
DOCUMENTATION MADE EASY

FileNET Corp. put its Panagon Content Services Server through the Windows 2000 certification process "for our customers' sense of well-being," explains Matt Bogusz, program manager for content services. "We wanted to ensure that if our customers opt to move to Windows 2000, our application will go along with that, and they don't have to worry. It just makes it a whole lot easier for them."

The way Bogusz sees it, certification is a "step above" basic compatibility. "There's one level, where your product runs at least as well on Windows 2000 as it did before. But now the bar has been raised on features such as Active Directory, ease of use, and install ability. Our product takes advantage of those new features."

Nick Tuson, director of product marketing at FileNET, says, "Many of our customers have a heavy investment in and deep reliance on Microsoft technologies. Therefore, they want to feel confident that their applications will continue to support and work with newer versions of Microsoft technologies—they want to be sure their applications will continue to run in the Windows 2000 environment and really take advantage of all of Windows 2000's features and functions."

FileNET
The Substance Behind eBusiness



Matt Bogusz, FileNET program manager for content services

JEFF KEARNING/MERCURY PICTURES

Going through the certification process gives customers "the confidence of moving forward and planning their new environments, knowing we will support that environment as well," Tuson adds. And it's also a definite advantage to FileNET. "Customers want to talk to the partners that understand the new platforms. Certification helps," he says.

Panagon Content Services Server allows users to easily access, view, and manage massive amounts of business information stored in scalable, networked document libraries. It supports over 200 document formats, including images, video, and compound documents that consist of pages "linked" together. Panagon Content Services Server manages dynamic electronic documents throughout their life cycles—from collaborative creation to secure delivery, revision, and re-use. In fact, FileNET uses its own family of Panagon software to help manage its Web site (www.filenet.com).

ENGINEERING DOCUMENTS TO MEET SAFETY REGULATIONS

Chevron Corp., the Houston-based petroleum giant, uses

Panagon sortware to help meet extensive government safety regulations. "There was a rule passed in 1992 that refers to plants and refineries that deal with flammable or hazardous chemicals," explains John Purdin, director of business development for Chevron's integrated document management solutions group "You have to go through procedures to make operations available—you have to have engineering drawings, training that's up to date and documented," and a whole lot more, he says.

"We use Panagon to maintain the current released versions of our documentation as well as previous versions for retention purposes," Purdin says These documents include material safety data sheets, engineering drawings, operating procedures, compliance audits, and many others. Some of Chevron's plants are using Panagon's Web-based services; others are not on the Web quite yet. But, Purdin says, "our direction is to move to all Web-based technologies."

They started testing Panagon 2000 in January, and have been impressed with its additional functionality. "We now have compound documents—word-processing documents with spreadsheets embedded in them—and we can create relationships between documents," Purdin says. "So we can relate a text document with an engineering drawing, and they're always linked."

Chevron is piloting Windows 2000 and will implement it in stages for both the desktop and the server over the next year or so Purdin says he's looking forward to that. When Chevron adopts a new application, its current setup requires that Purdin's crew write scripts to install it. "That's a challenge," Purdin says, and he's looking forward to using Active Directory to simplify the process.

"As we develop new document management services, we want to move in the direction of Windows 2000 on the server side," Purdin says. "It's more stable."

As the internal liaison for the certification process, Bogusz says that "VenTest [independent test lab] was very accommodating They work with you in real time to help you make fixes to meet the requirements. The requirements are stiffer than they had been in the past for earlier logo programs, but we look at that as an opportunity to improve our product." ▲

Applications Certified for Windows 2000

AAG Inc.
- Easy Web StoreFront

Alibre, Inc.
- Alibre Design 1.0

Art Info (Arti)
- Ideale 2000

Attachmate Corp.
- Attachmate EXTRA! Enterprise
- KEA! X Enterprise 2000

Attention System
- ATTN Enterprise Management

AutoProf.com
- Profile Maker

AVT Corp.
- Right Fax

BMC Software Inc.
- PATROL for Win2000 Server v2.0

BVRP Software
- PhoneTools

Caere Corp.
- OmniPage Pro 1 0

Ching Hang Information Co. Ltd.
- Super Consultant #7

Cristal Software AG
- Safir

Damgaard Group
- Axapta v.2.11
- Axapta 3 0

Datasweep Inc.
- Advantage Suite

Executive Software Int'l.
- Diskeeper Workstation 5.0
- Diskeeper 5.0 Server
- Undelete Server
- Undelete Server v.2.0
- Undelete Workstation

Fabasoft AG
- Fabasoft Components

FileNET Corp.
- Panagon Content Services Server

Gemplus Software
- GemSAFE

Guru Software
- GBA 2000I

Major Blue Company
- MBM—Major Blue Marketing

Microsoft Corp.
- Office 2000 Suite
- Project 2000

Motiva
- Motiva eChange Solutions

Navision Software
- Navision Financials

Net IQ Corp.
- NetIQ AppManager Suite v3.5
- NetIQ AppManager Suite Advanced Server
- Operations Manager

Palo Alto Software
- Business Plan Pro 4.0

PentaWare, Inc.
- PentaZip

Pivotal Corp.
- Pivotal eRelationship v.1

Prophet 21, Inc.
- Prophet 21 Wholesale

PTC (Parametric Technology Corp.)
- Pro/DESKTOP 2000I
- Pro/DESKTOP 2000I2
- Pro/ENGINEER 2000I2

Revit Technology Corp.
- Revit 1.0

Scansoft, Inc.
- Paper Converter
- TextBridge Millennium Pro
- TextBridge Millennium Pro Business

SolidWorks Corp.
- SolidWorks 2000

Step Ahead Software
- Steps Business Solution

Symantec Corp.
- PC Anywhere

TIDAL Software
- sys*ADMIRAL

TJ Group plc
- TJ Planner

Trend Micro Inc.
- PC-cillin 2000 7.0
- VirusBuster 2000

VERITAS Software Corp.
- VERITAS Backup Exec for Win Server
- VERITAS Backup Exec for Win Advanced Server

Visma Business AB
- Visma Business

WACOM Technology
- ECAD/dio

Wellan Systems
- EOS Accounting System 1.0

WRQ, Inc.
- Reflection for HP w NSVT
- Reflection for AS400
- Reflection for IBM
- Reflection for REGIS Groupics
- Reflection for UNIX and Digital
- Reflection X

NetIQ | It took NetIQ more than a year to build the Windows 2000 version of its software. Going for Windows 2000 server certification meant getting the best return on its investment.

Building the Best Product You Can

Operations Manager, from NetIQ (formerly Mission Critical Software), monitors servers and service levels in Windows NT and Windows 2000. Based on an extensible COM architecture, Operations Manager features include real-time security monitoring, customizable consoles to display multiple system viewpoints, and the ability to act on a multitude of events that may occur.

Merrill Lynch & Co. uses Operations Manager to help manage some 16 VPN servers worldwide, says Peter Kaufman, assistant vice president in Merrill's technology and infrastructure services group in New York. Kaufman oversees the firm's remote-access servers. He likes Operations Manager because "at a glance, from a Web console, you can look and see how all your servers are doing."

Kaufman appreciates how easy it is to generate reports in Operations Manager, and how it allows for automatic e-mail or paging in case of a problem. "Our help-desk people use it too," he says, "because it writes events to a built-in database."

He says his group is migrating to Windows 2000 for two major reasons: because it fixes a major bug they had with a previous operating system, and because it provides for more simultaneous sessions per server. Also, Windows 2000 "will give us a centralized way to manage remote access policies," Kaufman explains. "If different people or groups have access to different resources, or are allowed to connect for different times with different encryption, Windows 2000 will let us manage and control all that."

Olivier Thierry, vice president of NetIQ

CRAIG H. HARTLEY/MERCURY PICTURES

Kaufman's group is currently testing Windows 2000 on about a dozen different servers with Operations Manager.

They shouldn't find any problems, since Operations Manager was "built from the ground up" to leverage Windows 2000 and its many enterprise features, explains Olivier Thierry, vice president and product manager at NetIQ. So it was natural for them to go for Windows 2000 server certification.

The certification process helped the company "find stuff we didn't find in our testing," Thierry explains. There were some issues when deploying Operations Manager with Windows 2000 and Active Directory that had slipped through the cracks, he explains. "But when you bring in a third-party testing lab, you get another perspective—and these are things we're very glad we caught."

It took NetIQ over a year to build the Windows 2000 version of Operations Manager, with "completely new code," Thierry adds.

The result of the certification? "We have a better product," Thierry says. "It takes a serious amount of work and design and architecture to make your software a certified Windows 2000 application—it's not something you can add in after the fact." ▲

NAVISION | The company always sought Microsoft certification for its products, but the Windows 2000 process was especially rigorous and well worth it.

A NATURAL EVOLUTION

f we hadn't gone for certification," says Jais Agertoft, product manager for Navision Software in Denmark, "our customers would have made us do it."

That point was brought home at a recent sales meeting, where product managers from around the globe came together. "Everyone really feels this [Windows 2000 server] certification is very important to us," Agertoft says. "It adds stability, so customers know the application won't crash their server. And that's important, especially in business applications. Our customers can't afford any down time—and that's why we wanted to make sure everything works perfectly on the Windows 2000 platform."

> ***"Since our very first Windows application, which we released in 1995, we have always had Microsoft certification for our products."***
>
> —Jais Agertoft, product manager for Navision Software in Denmark

Agertoft's company makes Navision Financials—a software suite that offers customer resource management, e-business, and human resources as well as financials. Navision serves 39,000 customers in 89 countries. Most of those customers are running Financials on Windows NT, but Agertoft figures it's only a matter of time before they move to Windows 2000.

As it turns out, Navision needed no pressure to make the move to certification. "Since our very first Windows application, which we released in 1995, we have always had Microsoft certification for our products," Agertoft says. "So it was a natural evolution for us to go for Windows 2000 Server certification too."

However, Agertoft calls this certification process "completely different", from the logo-program testing he'd seen for earlier operating systems. "The requirements are much stricter in all ways," he says, and points out that although the certification process was quite a bit of work, it was well worth it in the end.

In the new version of Navision Financials that is certified for Windows 2000 Server, "we focused on the administrator role," Agertoft explains. "That person can now use Active Directory to administer all users, without having to have specific knowledge about Navision Financials." Because the application is so tied into Microsoft's server architecture, all administration—moving the user to another department, changing access rights, and so on—can be done through Active Directory.

There are a lot of benefits for the IT department with the Windows 2000 Server-certified version of Navision Financials, Agertoft says. "End users won't necessarily feel the difference, but the IT group will."

SEEING THE DIFFERENCE

One person who has already seen the difference is Ralf Månsson, the IT manager of Elbolaget i Norden AB, the Swedish electricity utility. The Windows 2000 version of Navision Financials has made their customer service much easier.

"We can shut down a server to do maintenance on it, and the users won't even notice. And if we expand our business with new servers, we can just add them—no problem," Månsson says. "What's more, it's a secure system. The clustering feature in Windows 2000 means that even if some chips or a hard drive blow up, we won't go down. That helps me sleep better at night."

Also, Navision Financials has helped Elbolaget serve its customers in ways not possible before. Utility workers in the call center now have centralized access to information the customers need; no longer must they jump among different screens.

"In the old days, with mainframes and minicomputers, you needed a team of men in white suits to guarantee constant availability," Månsson says. "Windows 2000 has made it inexpensive and easy for us to guarantee that the call center is always available." ▲

For more information on the certification process, contact the Technical Account Manager nearest you.

PHILLIP SMITH
phillip_smith@veritest.com
+61 (3) 9607 6310
10th Floor
150 Queen Street
Melbourne, Victoria 3000
Australia

ALEXIS EVRARD
alexis_evrard@lionbridge.com
+33 (04) 92 95 20 59
Europolis 1
1240 route des Dolines
06560 Sophia Antipolis
France

LEN REHARD
v-lenre@microsoft.com
+49 (089) 3176 4543
Microsoft GmbH
Edisonstrasse 1
85716 Unterschleissheim
Germany

KAZUNARI YOSHIKAWA
kazunari_yoshikawa@lionbridge.com
Ascii Network Technology
Sasazuka-Center Bldg
2-1-6 Sasazuka Shibuya-ku,
Tokyo 151-0073,
Japan

BRIAN LEEMING
v-brilee@microsoft.com
+44 (0) 118 909 3078
Microsoft Limited
Microsoft Campus
Thames Valley Park
Reading
RG6 1WG
U.K.

GUNNAR STOA
v-gstoa@microsoft.com
(425) 705-7156
Microsoft Corporation
One Microsoft Way
Building 20
Redmond, WA 98052
U.S.A.

MANDY CHAN
Microsoft
(310) 450-0062
230 Third Avenue
6th Floor
Waltham, MA 02451
U.S.A.

CRAIG BEAN
craigb@veritest.com
(310) 450-0062 x141
3420 Ocean Park Boulevard
Suite 2030
Santa Monica, CA 90405
U.S.A.

THE CUSTOMER'S CHOICE

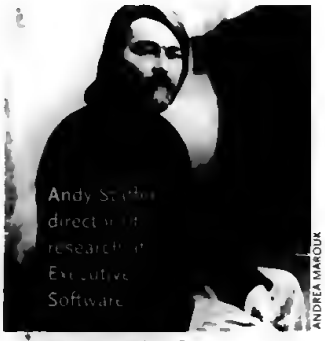
EXECUTIVE SOFTWARE | Certification is a way to raise the bar for software quality and software development.

Now that Diskeeper, a disk defragmentation utility, has made the Microsoft Windows 2000 certification grade, "Our customers tell us that they use the Windows 2000 Server certification process as part of their selection criteria," explains Andy Staffer, director of research at Executive Software in Glendale, Calif., and the person responsible for the technology development of its products.

"It's a confidence factor," Staffer says. "Customers know this piece of software is doing what it should. When they deploy it on hundreds of servers, they'll know it works correctly."

That's what's motivating James Faircloth, director of information systems at C&M Medical Services, Inc. in Metairie, La., and a Diskeeper customer. "I want to move over to Windows 2000 on my servers, and I need something that understands Windows 2000 natively, without going through hoops," he says. For that reason, he will continue to use Diskeeper, as well as other Windows 2000 Server certified applications, as he transitions over.

Staffer characterizes the certification process as "very thorough." He notes that VeriTest was extremely supportive during the testing phases, helping Executive Software work out various kinks to ensure the product passed certification with flying colors. "The certification process raises the bar for software quality and software development. It just makes everything more robust."



ANDREA MARQUK

Robustness and performance are crucial to Diskeeper, since its claim to fame is helping improve system performance. The software takes files that are fragmented—stored in pieces on a disk—and makes the files contiguous. This increases performance, because the system no longer has to search all over to get the file's information; it's all in one place.

Diskeeper customers can't seem to say enough about the software's benefits. Claus Martel, command IT manager for the U.S. Army Aviation and Missile Command in Redstone Arsenal, N.J., counts himself a Diskeeper enthusiast. "We're at a military installation with over 7,000 users, and I've recently recommended to our Commander that we make Diskeeper a necessary part of our IT department's protocol when they install Windows 2000. It's a tool as necessary as anything else I have—I can't live without it!"

That's the kind of comment that makes Andy Staffer believe that the efforts needed to make Diskeeper become Windows 2000 Server certified were all worthwhile. ▲

BUT WAIT, THERE'S MORE!

THESE COMPANIES WERE AMONG THE FIRST TO HAVE THEIR APPLICATIONS CERTIFIED FOR WINDOWS 2000 SERVER AND/OR WINDOWS 2000 ADVANCED SERVER.

PIVOTAL CORP., Kirkland, Wash.
Its certified application is Pivotal eRelationship 2000, which automates all facets of marketing, sales, and customer service relationships among partners, employees, and customers. Pivotal calls its market "eBusiness relationship management"—it's a whole new class of business-to-business interaction on the Internet. Gord Breese, director of strategic alliances at Pivotal, says his company went through the certification process because "We knew it would dramatically improve our ability to serve our customers in the most demanding systems environment."

DAMGAARD INC., Atlanta, Georgia
Its certified application is Damgaard AXAPTA, a complete and flexible ERP system that includes its own development environment, called MorphX. AXAPTA includes all the functions a mid-sized company needs to run its business—financials, sales orders and purchase orders, logistics, production, and project management, among many other modules. AXAPTA remains the only ERP system certified for Windows 2000 Server. "As customers deploy, they'll be much more focused on certification," says Daniel Bebort, corporate product manager of technology at Damgaard. "And we'll be ready with manageability, scalability, and reliability. ERP systems that aren't certified will look kind of old and impractical."

VERITAS SOFTWARE CORP., Mountain View, Calif.
Its certified application is Backup Exec, a backup and restore facility for the entire Windows 2000 system, including Active Directory, COM+, Registry, system volume, and system files. The new Windows 2000 file system changes, including disk quotas and encrypted files, are also fully protected. Eugene Outler, engineering program manager for Backup Exec, says, "We've found in discussing things with customers that certification is most important in areas where customers have limited resources or are on a fast deployment track. We've heard that anything they can do to reduce the learning curve will help."

NETIQ CORP., Santa Clara, Calif.
Its product is NetIQ, a systems management solution that monitors the system performance, reliability, and availability of over 30 distributed Windows NT and Windows 2000 servers. NetIQ is certified on both Server and Advanced Server, meaning it supports cluster services for enhanced scalability and reliability. It also monitors Active Directory to track key statistics, including replication traffic and the growth of Active Directory data. Tom Kemp, vice president of marketing at NetIQ, says there are "a number of payoffs" to certification, the most important being continued customer satisfaction. "Customers will feel confident deploying our product in a Windows 2000 environment. It will be more reliable" than applications that aren't certified, Kemp says.

MOTIVA, San Diego, Calif.
Its certified application is Motiva eChange Solutions, a design change management product for manufacturing companies. The software allows manufacturers to manage and automate product change among business teams, supply chain partners, and customers. It helps with input, review, approval, and publication of design changes and advanced configuration management. eChange is also integrated with CAD solutions and with other core business systems, including ERP and customer relationship management. With more than 180 customers in the United States and Europe, Motiva eChange Solutions are at work in some of the largest manufacturing companies in the world, including 3M, ALCOA, British Telecom, Nissan, Pacific Gas and Electric, Pilkington Glass, and Shell Oil. ▲

TESTING, TESTING

Why "Certified for Windows" is a real specification and testing plan that you'll want to know about for your IT shop.

Q *Why should I believe this isn't just marketing hype?*

A The certification program is based on a comprehensive specification developed by end users and others. The specification covers the core set of enterprise server features and functions in Windows 2000. VeriTest, an independent PC testing lab, administers the program. Applications earn the certification from VeriTest, not from Microsoft. GartnerGroup claims that using applications that conform to the certification specification will result in lower total cost of ownership. GartnerGroup even says it makes sense to follow the application specification for development of homegrown applications, too.

Q *So how does an application pass muster?*

A There are 700-plus pages on VeriTest's site that cover the specific tests run on the application seeking to be certified. In broad terms, the tests include: Windows 2000 fundamentals (32-bit support, core application stability, long file names, etc.); install/uninstall procedures (certifying that the application doesn't try to replace files that are protected by Windows File Protection and that it installs shared files in the correct locations, etc.); user interface fundamentals (certifying that the application supports standard sizes, colors, font settings, etc.); Active Directory (which checks how the application uses Active Directory's objects and schema, etc.) and Security Services (which checks support of single sign-on required for certain types of applications). Advanced Server applications must also support Cluster Services (they must be able to install on two nodes and support failover, etc.).

Q *How did this specification come into being?*

A For more than two years, a team consisting of 10 major user organizations, several independent software vendors, and Microsoft worked to produce the Application Specification for Windows 2000. The purpose of this detailed specification is to ensure that the applications certified under its rigorous standards fulfill the promise of Windows 2000 for stability and performance. The specification is a roadmap for building highly reliable applications for Windows 2000, and certification is a guarantee that the application will fully exploit the benefits and new features of Windows 2000.

Q *What else is interesting about the certification program?*

A There are many resources that go into making this happen. Server application vendors pay to test their software—the amount varies depending on the kind of application being tested. There are nine full-time employees in Microsoft and partner labs, called Technical Account Managers, dedicated to helping developers pretest their applications. They also give on-site presentations about certification.

Q *How can I find test results on each certified application?*

A While the detailed results are confidential, VeriTest does post summary documents for each application. In these documents, end users will find important notes regarding support for the Application Specifications for Windows 2000. You can view these documents at www.veritest.com/certified.

Q *Where can I get more information?*

A There's a lot of information about the program available online. The certification home page on Microsoft's site is at http://msdn.microsoft.com/certification/. You can read the server and/or desktop Application Specifications for Windows 2000 by going to http://msdn.microsoft.com/certification/download.asp. Also check out VeriTest's site, at www.veritest.com. ▲

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Continued from page 66

the attention of every financial institution in the world."

It should. Schwab currently manages about 42% of total online assets, more than twice as much as its nearest rival. The author of much of that success is Pottruck, who is in charge of executing Schwab's vision.

In 1996, the pioneering discount brokerage found itself on the wrong end of the priceline, as upstart pure-play Web brokerages began charging $25 per trade compared with Charles Schwab On-Line's $64.

Pottruck fought back with a new, no-frills division called e.Schwab, going head-to-head with the online firms. E.Schwab customers would pay $29.95 per online trade — including a $5 premium for its brand — but would sacrifice access to the full range of Schwab services at branch offices and call centers.

It worked. By 1997, e.Schwab had joined Charles Schwab On-Line among the top online brokerages.

But Schwab looks beyond its apparent success. " 'If it ain't broke, don't fix it,' is not a notion we have here," Pottruck says.

"A core principle is that Schwab focuses on what their customer wants," Payne says. "They have been remarkably adept in anticipating customers' future needs and demands."

Schwab found that e.Schwab customers wished they had access to the Charles Schwab services, while Charles Schwab On-Line customers envied e.Schwab prices.

Pottruck says he knew he had to combine low price with high service. But that would cost Schwab $150 million of its then-annual $250 million profit. "We knew it would have a huge impact on our growth and our profits and our stock price," he recalls. "We presumed it would make 1998 a very tough year. It was a very scary decision."

It was particularly scary for a company leading its market. But Schwab had decided to go down a new path — to use its multiple channels as a competitive advantage across all the competition rather than compete head-to-head with pure-play online brokerages.

Clicks and Mortar

Pottruck calls this strategy "clicks and mortar." It has differentiated Schwab from competitors and won kudos from analysts. "Schwab was one of the first to recognize that the Internet was not exclusive of their other channels [but] another choice in the lineup," Payne says.

Nevertheless, 1998 was a tough year. Schwab's earnings initially fell short and its stock price tanked, losing nearly one-third of its value before a surge in new customers brought back equilibrium by year's end.

The upward spiral continues. Although Schwab makes smaller commissions for online trades, those trades cost far less for Schwab to execute than traditional trades. Meanwhile, its Internet volume has spiked. Last quarter, 79% of all Schwab trades were made online, up from 65% a year ago. Schwab had 3.7 million online accounts with $418 billion in online assets, up 48% and 91% respectively, from a year earlier. "Schwab is an asset-gathering machine, and it has leveraged the Internet to help them gather those assets," Payne says.

Observers laud Pottruck's ability to anticipate change and act on it. "Schwab is a culture of change — of continual reinvention," says Harvard University Professor F. Warren McFarlan, who has studied the company's culture. Pottruck, he says, is "passionate about change, and those personal skills [around self-reinvention] are critical to that."

For Pottruck, it's elementary. "You cannot be successful in the technology world if you're not willing to change," he says. "You can't be a one-trick pony."

Pottruck practices what he preaches.

HE'S ALWAYS HAD DRIVE AND ENERGY, BUT HE'S MATURED AS A LEADER.

BETH SAWI, CHIEF ADMINISTRATIVE OFFICER AND EXECUTIVE VICE PRESIDENT, CHARLES SCHWAB & CO.

"He's always had drive and energy, but he's matured as a leader," says Beth Sawi, Schwab's chief administrative officer and executive vice president. Back in the '80s, when she worked for Pottruck in marketing, she found his hard-driving style difficult. "Every time I saw him, I'd come away with a long, long list of new things to do," she remembers. "It was just overwhelming. I felt like I couldn't win with this guy."

Others felt the same, and in a desperate effort to make him prioritize tasks, Pottruck's staff presented him with cutouts of a light bulb — for ideas that were just things to think about — and a gun — for things they had to "get done or else," Sawi recalls. "We said, 'You don't even have to say anything, just wave whichever one it is.' "

Pottruck took the hint. "He has a very good sense of humor, and he's very good at accepting feedback," Sawi says. "To this day he says, 'This is a gun; this is a light bulb.' "

Pottruck moves the company along as well. Lepore recalls that shortly after she was promoted to CIO in 1993 and joined Schwab's executive committee, Pottruck asked her how it was going. "I said, 'Everything is so male!' "

"We were always 'punting' and 'passing the ball' and comparing industry people to sports figures," she says, "and half the time I didn't even know which sports they were talking about."

Pottruck took action. "The next time a sports analogy came up, he talked about what that analogy meant, not in a condescending way but in an inclusive way," she says.

Nurturing IT Loyalty

Lepore and Pottruck go back 16 years, and she says he has taught her about the importance of building strong relationships and personal loyalty. "He leads with his heart as well as his head," she says.

IT strategy is rooted in Pottruck's image of Schwab as "a technology firm that happens to be in the financial services business." Pottruck learned the ropes as an IT project manager at Citibank during the '70s and has kept up with tech trends ever since. "He has such a keen knowledge and appreciation for technology that he's a wonderful thinking partner," Lepore says. "It's a big boon to my job."

So is his willingness to move forward without a complete road map. "I don't worry about failed projects," he says. "I worry about missed opportunities."

For example, Schwab's software-based online trading services started back in 1985 with a "very clunky, not very functional or user-friendly" DOS-based PC application, Pottruck recalls. By 1992, Schwab had a friendlier Windows-based product, followed in 1995 by the Web-based e.Schwab.

That long road was a learning curve, he says, and as other players were just beginning to realize the Web's potential, Schwab already had 10 years of online experience under its belt. "We're not afraid of trying when we don't know all the answers," Lepore says. "We had to get in there and learn about this stuff."

Pottruck says that Schwab has a long way to go to achieve its goals. "But we have a very clear sense of what we need to do," he says, "and we have been pursuing that path with relentlessness."

Relentlessness but not ruthlessness. Pottruck says modeling ethical behavior is a prime part of every business leader's job. "This is not an easy thing to do because we all have our weak moments," he says. "But we strive to be the best we can be.

"That's the responsibility that comes with the job," he concludes. "If you don't want the responsibility, don't take the job."

Name: David S. Pottruck

Age: 51

Title: President and co-CEO, Charles Schwab & Co.

Location: San Francisco

Previous experience: Senior vice president of consumer marketing, Shearson/American Express

Education: BA, University of Pennsylvania, 1970; MBA, The Wharton School, 1972

Married; two grown children

Windows 2000

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Bluetooth Wireless Technology Linking Portable PCs, Cell Phones and Other Devices

New wireless technology for Compaq portables promises to change the way we work on portable computers and redefine how networks link people together. At the heart of Compaq's strategy is the Bluetooth personal area network technology, which can wirelessly link portable computers with cellular phones, handheld computers, office desktop PCs or other portables, as long as they're within 30 feet.

Users Gaining Unprecedented Remote Access Capabilities

Compaq's new Remote Insight Lights-Out Edition board gives IT administrators around-the-clock access to their servers, regardless of location.

The 2000 Generation: BackOffice Server 2000 Targets Various Businesses

When building a corporate IT infrastructure, various businesses departments and branches have a unique set of needs. BackOffice Server 2000, Microsoft's latest in its 2000 Generation series of server suites, will meet those needs by providing tools and services for building a solid information technology foundation.

Quick Poll

As you learn more about Windows 2000, do you believe it will be easier or more difficult to implement?

Cast your vote now at

www.Windows2000Advantage.com.

Check out the current results: ▶
Base: 90

Microsoft

▶News

Gates Talks about Building the Internet for Business

By Stefanie McCann

During the recent TechEd conference in Orlando, Fla., Bill Gates delivered a keynote speech highlighting Microsoft 's aggressive role in the next generation of business computing over the Internet. Gates talked about where the Internet has been, and what it is going to mean to businesses in the future. He explained that we are currently in the third phase of the Internet. The first phase enabled companies to build a presence, and the second phase was about making transactions over the Internet. This next phase is about business processes and how the Internet can be used to execute these processes.

Today the Internet is a place where people go to get information. It's a place where enormous amounts of data are stored and accessed by users. In this next generation, we shouldn't think about the Internet as a presentation device, but a platform, according to Gates.

"I think it was inevitable that we would get to this phase," he said. "All technologies go through sort of a honeymoon period, and eventually you get down to the bottom line – how is it really going to affect business. To make this happen, We need a new generation of software tools that are going to make it easy to build the Web sites for phase three."

At Microsoft's TechEd Conference Bill Gates talked about the future of the Internet.

Gates and his team demonstrated two of Microsoft's software tools that will help make phase three a reality.

Using Visual Studio 7, Dave Mendlen, Visual studio product planner, showed the audience how he could very quickly create Web services. Using Windows and Visual Basic, developers have been able to create Windows applications by dragging components from a toolbox onto a form and "basically painting their applications," said Mendlen. "We've taken that concept and applied it to building middle-tier objects and Wab services."

One difficult part of building Web services is finding the server resources that axist on the network. With Visual Studio 7.0, developers can go to one window and see all of the server resources such as event logs, performance counters and message quaues. To build the Web service, all tha developer has to do is drag these components into tha component designar, called rapid application devalopment (RAD), for the Server. Next Mandlen brought up some code – about 5 or 6 lines – from the toolbox – to connect everything together and then he had a web service. ▶

For the full text of this story, visit www.Windows2000Advantage.com

ADVANTAGE

The Web Magazine for IT Leaders implementing Windows NT and Windows 2000 with Compaq Services and Solutions

Windows 2000 Proves its Reliability

By Elisabeth Putnam

Only two months after Microsoft began shipping Windows 2000 Advanced Server, the platform isn't just catching on within the corporate enterprise. it's already there.

Users are going for Windows 2000 as a server platform that offers the same price performance advantages as NT, but with greater reliability and manageability, says Joseph Clabby, vice president, platforms and services at Aberdeen Group. "I will say that I'm surprised it took off so quickly," Clabby declares.

During late 1999 and early 2000, Aberdeen Group interviewed a number of its enterprise clients, and found that many were already starting to buy. "We see two types of buyers in particular: front-end dot-com sites and back-end IT people running the accounting, manufacturing and financials," Clabby says.

Some companies are still evaluating and testing Windows 2000, particularly the enterprise-scale Datacenter version that is due to ship later this year. As Clabby notes, "When you're dealing with the enterprise level, there's slower adoption."

Then there are the eager beavers who began testing pre-production releases of Windows 2000 Advanced Server as early as last summer, through Microsoft's Windows 2000 Rapid Deployment Program. Many of these companies finished their tests and began deploying mission critical applications on Windows 2000 servers months ago. Now they have their own impressive performance and reliability statistics to share with colleagues.

Oklahoma Supreme Court, for example, moved a mission-critical enterprise case-tracking application onto Windows 2000 servers last December. "We haven't had any operating system related failures on Windows 2000 yet," comments Kevin King, the state judicial organization's MIS director. "We always had good reliability with our NT 4.0 servers, but we'd get two or three blue screens a month on our server farm."

Furthermore, Microsoft recently published a study of nine dot-com businesses who were early deployers of Windows 2000 Advanced Server. The installations averaged 99.95% availability over a total of 8.42 runtime years, according to Microsoft. "This level of availability is outstanding," given that companies hadn't had time to optimize performance or build IT expertise, and were running multiple pre-production versions, says Clabby.

What follows are three reports from the trenches: early Windows 2000 server installations talking about what motivated them to implement the operating system ahead of the pack, and how it has met their needs and expectations.

Barnes&Noble.com

An online book seller that has served more than four million customers in 210 countries, Barnes& Noble.com needs a server platform that not only can keep up with a rapidly-growing transaction volume, but can scale up quickly and easily to meet seasonal or unexpected demands.

In 1998, the company standardized on a three-tier Web server platform of Compaq servers running Windows NT to maintain rapid, reliable service while its business took off. Anticipating even more rapid growth over the next few years, IT began testing Windows 2000 Advanced Server last summer. Last fall, the company migrated to Windows 2000 and Compaq ProLiant 8Way 6500 servers. ▸

For the full text, visit **www.Windows2000Advantage.com.**

www.Windows2000Advantage.com

Point

Compaq ProLiant 32-Way Server Delivers Partitioning

By Paul Desmond

The 32-way servers Compaq is slated to release later this year represent at least two firsts for Compaq ProLiant servers: a system with more than eight processors and with support for server partitioning.

Compaq is positioning the new machines, which will come certified to support Microsoft's Windows 2000 Datacenter, as a lower-cost, industry-standard alternative to large competitor Unix machines and even mainframes. Scheduled to ship by year-end, the machines will be a welcome addition for users with large database and enterprise resource planning applications that are pushing the limits of existing eight-way servers.

Partitioning will enable users to split the machine into multiple logical servers, turning a 32-way machine into four eight-way servers, for example. Microsoft Windows 2000 Datacenter will support this, and in fact allows customers to install up to 16 copies of the operating system on a 32-way server.

Longer term, the advantages of partitioning will be far greater. Microsoft is at work on enhancements to Datacenter that will enable dynamic partitioning, says Michel Gambier, group product manager, enterprise server marketing. That will enable capabilities such as load balancing among multiple logical servers on a single machine. Such features are roughly two years away, he says.

In the meantime, partitioning is more static, requiring that the machine be powered down to configure partitions. "The ability to move CPU or processor resources from one application to another, even if that requires a reboot, is still very interesting," Gambier says.

Partitioning enables processors on a single machine to be divided into multiple groups, each of which runs independently of the others with its own instance of the server operating system. If one partition fails, the others can continue operating unscathed.

The capability has been a mainstay in the mainframe realm for years. ▸

For the full text, visit www.Windows2000Advantage.com.

LANDS OF OPPORTUNITY

100 BEST PLACES TO WORK IN IT

Top companies say investments in career development yield big dividends to employers and employees alike. By Joanie Wexler

WITH IT EXPERTISE scarce and employee turnover at an all-time high, *Computerworld*'s Best Places to Work have devised generous and creative career development programs that help them retain skilled professionals while enabling them to meet their ever-changing information technology challenges.

Many Best Places companies say they view professional development in the same light as research and development functions, with the belief that investing in individuals' career development will yield significant returns.

To this end, some have developed internal "IT universities" with curricula that span the gamut from Java development to Linux administration to project management.

Others have teamed with outside training companies for classroom-based certification training.

Still others have embarked on Internet-based learning, which can be honed to a particular individual's professional development needs and schedule.

The value that Best Places companies place on training is illustrated at Sonoco Products Co., a global manufacturer of packaging materials in Hartsville, S.C. "Training is one of the monthly metrics that we track and report to the chief financial officer — just the way we track and report network availability," says Steve Wyatt, director of corporate services at the firm's information services group.

Wyatt, an 11-year Sonoco veteran, says the IT department annually plans the skills and training that will be needed. Each month it measures the number of people and hours against its yearly plan to make sure the IT staff is staying up-to-date.

"Productivity will suffer if we have to play catch-up. If we don't invest today, we won't have the resources we need in the future," he says.

Nearly all Best Places companies empower employees to take charge of the short- and long-term directions of their careers by matching employee aspirations with the IT needs of the organization.

> *I started learning [Unix administration] because I needed to.... Then it occurred to me that all I'd have to do is take a test and I'd have a certification. The industry tends to put a lot of stock in the letters behind your name.*
>
> JOEL HOWLE, LEAD SYSTEMS ENGINEER, SONOCO

For example, Harley-Davidson Inc. recently launched the Employee Management Development Program, says Mark Dickson, senior systems manager at the company's Produce Products Group. The program is aimed at moving certain IT candidates into management positions during a 12- to 18-month period and creating "management heirs" within the Milwaukee-based company.

Terri Coughlin, a senior IT project manager who has grown interested in the business aspects of IT, earned admission into the Business Unit Operations branch of the program after successfully wrapping up several large, visible information systems projects within the company.

After eight years at the company, Coughlin has joined a 50-person Harley-Davidson subsidiary to learn the ins and outs of its business processes. "This will prepare me to move to the user side working with IT and reach the next tier of management," she says.

No Skimping Here

Best Places companies are generous with funding for industry certifications and classes. Last year, they spent an average of about $3,600 per IT employee on training, and IT employees averaged close to 12 days of professional development on the companies' time.

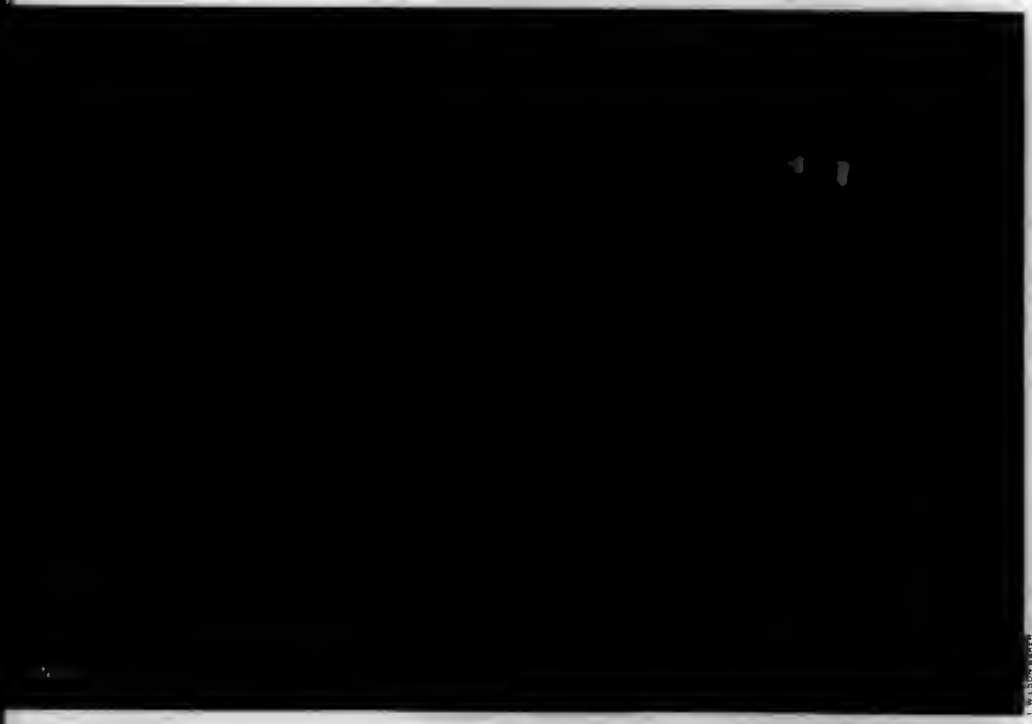
The IT leaders interviewed for this article also noted that they have the flexibility to stretch career development dollars, if the need arises, to go beyond the training budget.

For example, Joel Howle, lead systems engineer at Sonoco, has been able to add five vendor certifications to his résumé in the past four years. When Sonoco began migrating from an IBM SNA network to an IP network, Howle took the opportunity to begin learning everything he could about LANs and client/server computing.

"The mainframe guys didn't want to do Unix administration," Howle says. "I started learning because I needed to.... Then it occurred to me that all I'd have to do is take a test, and I'd have a certification. The industry tends to put a lot of stock in the letters behind your name."

Howle holds two Microsoft Corp. certifications, two Cisco certifications and a Linux administration certificate. He is now preparing to take his lab exams for the mother of all Cisco Systems Inc.'s certifications, the Cisco Certified Internetwork Expert, for which he has already passed the qualifying exam.

When Catherine Lukhard, a telephony production support specialist, joined Falls Church, Va.-based Capital



One Financial Corp. five years ago as a customer service representative, she leveraged the company's Development Actioo Plan to set her career path toward IT.

Each quarter, Lukhard and her manager decide what she must do to take the next step — a series of activities that has included work oo finishing her bachelor's degree in information systems, project management educatioo and classes to hone her presentatioo skills.

Lukhard moved from customer service to database administratioo and oow supports the company's call-routing systems and voice-response units. Her short-term goal is to join Capital One's telephony architecture team.

To help her achieve this goal, Lukhard represents her group on a companywide problem-management committee that identifies problems that occur in the corporatioo and determines how to prevent them from recurring.

"As the representative from my area, I'm learning about broader IT issues," she says.

The companies that educate IT staff about how the business works — so the employees understand the context of their work — say they have better-skilled staff and more-rewarded workers.

For example, Ash Brooks, vice president of end-user computing at Arrow Electronics Inc. in Melville, N.Y., says a weeklong orientatioo program for new employees pays big dividends. The program includes a trip to a local distribution warehouse to witness operations.

"From an IT perspective, it helps us support customer oeeds much better," Brooks says. "It's important for us to understand what the company is trying to achieve and translate that to the desktop level."

Turning to the Internet

The MONY Group Inc. has just begun an Internet-based training series in several areas it has identified as core competencies, such as project management, explains Marianne Churgin, assistant vice president of IT. The New York-based financial services company uses the Web-based training library of MindLeaders.com (formerly DPEC Inc.) in Columbus, Ohio, to deliver technical, professional and practical skills courses to IT workers' desktops.

"You can take a course at your desktop, at home or at work — all you need is a password," she says. "If you are an insomniac, you can complete your courses in the middle of the night."

To help move employees into new techoologies, the company has also partnered with an outside training firm that offers certificate programs in network engineering, Unix and intranet/extranet technologies.

"Such programs, for example, can help mainframe Cobol programmers retool themselves. Employees pick a core curriculum and do them on their own time, but they are 100% reimbursable," explains Churgin. "It usually takes one to two years to complete a certification."

Churgin notes that 39 MONY Group staffers graduated in a certificate program last year.

Retention Benefits

What keeps highly skilled IT staff at Best Places companies loyal? After 12 years at his company, Howle says, "Sonoco has been real good about being aware of our curreot market value and keeping us current with our skills. You don't get stale here."

At Staples Inc. in Framingham, Mass., Staples University is helping retrain experts in AS/400 and Oracle applications in Java and HTML, so they can move internally to the dot-com area, says David Barclay, vice president of information systems for merchandising and supply chain.

Of course, there is more to employee retentioo than generous training programs. Ultimately, says Churgin, employees who feel valued are the ones who stay.

"You can provide great training, but if people don't feel that they are working on anything important, training alone won't do it," she says. ▶

Wexler is a freelance writer in Campbell, Calif.

Top 10

Best companies to work at in IT for career development

Rank	Company name	Annual survey of employee satisfaction	Number of employee reviews	Mentoring program available	Internship available	Chance to discuss career development	% of IT staff promoted in 1999	Staff in [illegible] formal training in 1999
1	Harley-Davidson Inc.	✖	Four times per year	✖	✖	✖	16%-20%	80%
[illegible]	Avnet Inc.	✖	Four times per year	✖	✖	✖	11%-15%	80%
3	Sonoco Products Co.	✖	Four times per year		✖	✖	16%-20%	90%
[illegible]	PricewaterhouseCoopers	✖	Three times per year	✖	✖	✖	31%-35%	100%
5	The Reader's Digest Association Inc.	✖	Twice per year	✖	✖	✖	31%-35%	80%
[illegible]	Capital One Financial Corp.	✖	Twice per year	✖	✖	✖	31%-35%	85%
7	The Home Depot Inc.	✖	Twice per year	✖	✖	✖	26%-30%	100%
[illegible]	Walt Disney Entertainment Inc.	✖	Twice per year	✖	✖	✖	26%-30%	85%
9	The MONY Group Inc.	✖	Twice per year	✖	✖	✖	21%-25%	100%
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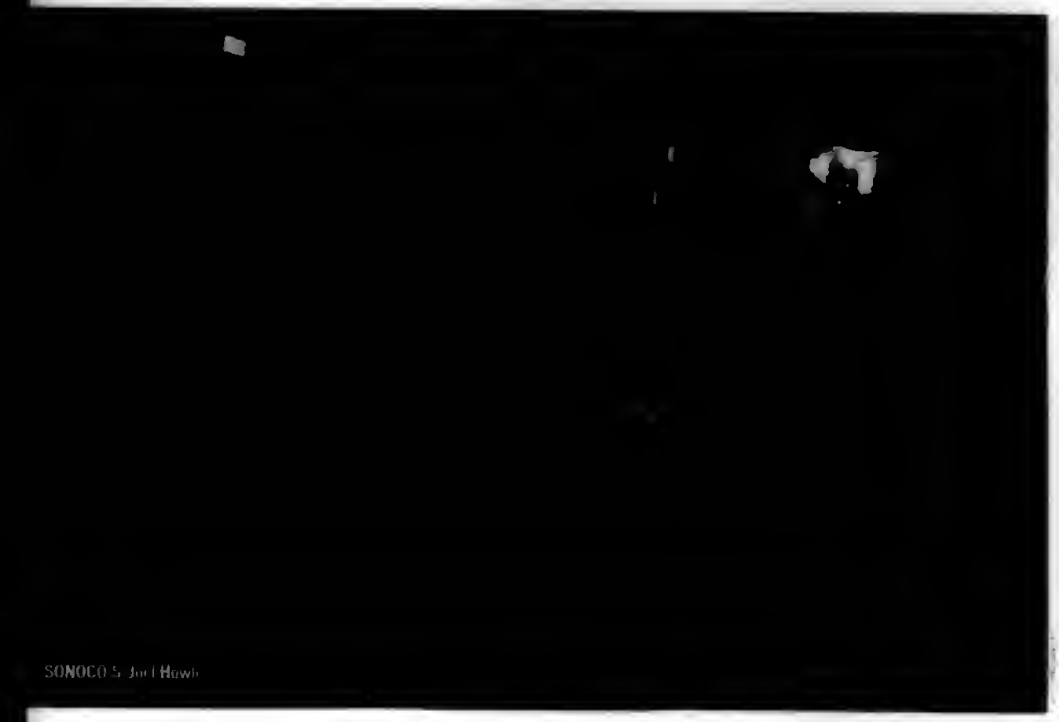

SONOCO's Joel Howle

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TAKING TECHIES TO THEIR LIMITS

100 BEST PLACES TO WORK IN IT

Nothing is more important to a technologist than technology, so the Best Places to Work make sure their full staffs share access to hot projects, key skills and leading-edge development critical to the business. By Christine Willard

WAKING UP in the morning and looking forward to getting back to the technical challenges of your work is one of the most potent sources of job satisfaction. For technologists, that means intricate projects that amaze and awe.

The respect and appreciatioo from the business side for information technology's contribution to success are what employers with hot projects offer their IT staffs.

"Your Web site is only as good as the product that ends up inside the customer's house," says Roseann Lucas, a technical delivery project manager at Electronic Data Systems Corp. in Des Moines, Iowa. "We want to be the engine that's powering the action behind the scenes of the glamour of the Web site." Lucas says her team intends to have a oew order-management system available by late summer or early fall to clients who sell merchandise online or through catalogs.

"It gives them the capability to interact with the end consumer online and in real time, through a consumer response or call center as well as in the e-commerce realm," Lucas explains.

Being part of that kind of technology, taking it to its limits and gliding on to the next generation attracts the top talent and keeps them happy. Vendors like EDS, Intel Corp. and NCR Corp. — all on the list of Best Places for Hot Projects — are in the business of staying on the bleeding edge, creating the technology that industry runs on.

Lucas joined EDS's 80,000 IT employees via an acquisitioo in 1991. Since then, she has made her way through a variety of projects in what Dan Ward, director of organizational resource planning, describes as a matrix, or lattice, of job opportunities.

At Plano, Texas-based EDS, IT professionals can find out what skills they need to join a particular team, get the training and let the company know wheo they're ready to move ahead. "Wheo you meet the criteria, you move up," says Lucas. "You cboose when you are ready."

Technologists are also taking their place at the table for business-management decisions. With a full appreciation for the importance of technology issues comes greater opportunities for IT to participate on the business side.

Rapid Deployment

Iotel's IT staff had to be ready when its e-commerce investment went from zero to $1 billioo per mooth in six months. "It's a combinatioo of really smart people, disciplined management, a strong team ethic, the ability to apply resources where we need them and a culture that lets people switcb gears rapidly," says Doug Busch, Iotel's vice president of IT.

At Intel, IT is consulting on new projects like virtual private networking, load balancing and Secure Sockets Layer acceleration products for e-commerce. The close connection to Intel's business strategy gives IT constant feedback on how the products impact Intel's ability to deliver in the marketplace.

George Moakley now leads a team of 16 as director of enterprise architecture in a lab spun off three years ago from IT. "We anticipate the kinds of business systems that will be built in the strategic time frame so we can understand how to make Intel products the best possible products for those businesses," he says.

Moakley will be tripling his team in the coming months, looking first within Intel's ranks. Then he will cast around for outside talent who can inject new perspectives, whether fresh from graduate school or other parts of the industry.

"We think there's going to be some interesting development in the third generation of e-business and how that maps to finer-grained enterprise application integration and the whole outsource solution provider space, like ASPs and ISPs," Moakley says.

Internally, technologists are coping with the conductivity issues of a rapid rollout to provide Internet service to 70,000 PCs in employees' homes. Intel employees spend about two years at any given job. "You are encouraged to broaden your skills and visibility," says Kevin D. Small, acting buman resources manager for IT at Intel.

With open encouragement across

LEIGH CHARLTON

business functions and IT, Intel's technologists move into a wide range of opportunities, from Web hosting to Intel Architecture Laboratories and the IA64 Venture Capital Fund, which makes equity investments in start-ups.

"Intel makes a point of cross-pollinating, moving people between business units and IT," giving everyone the opportunity to benefit from other kinds of experience, Moakley says.

"We're really proud of the fact that IT is the development pool for people to develop skills that are incredibly valuable to other parts of the company," says Busch.

"We consider NCR's IT department a software engineering business," says Don Hopkins, NCR's vice president of global application development. Dayton, Ohio-based NCR provides hardware and software for business transactions as well as data warehousing to collect and store customer information.

Using its own Teradata Corp. warehouse, NCR pulls in the company information and stores all data from the Web site, so it can analyze what customers are doing. "That's a directly derived business benefit," says NCR CIO Sam Coursen. "IT people want to know they are having an impact on the company's success."

Using global pools of employees with similar skills allows more employees more opportunity to work on hot projects. Taking on a variety of roles on different projects helps IT workers broaden their skills, build their résumés and gain experience for future advancement into management.

E-commerce is extending its reach to global markets and its penetration through layers of business. New applications take on lives of their own and spin off into new businesses. The technology to manage and support all the new infrastructure is more complex and mobility and geography demand new answers from IT organizations.

Avnet Inc. is extending globally from its Phoenix headquarters, rolling out products across Asia. "We really need to understand our impact on the industry and, in some cases, the economy," says CIO Steven J. Bandrowczak. "We're redefining business."

Touching People Through Technology

IT staffers have to think like the sales side to create e-commerce tools. "How do I touch that person through technology?" Bandrowczak asks rhetorically.

Avnet distributes semiconductors and interconnections, passive and electromechanical components and computer products. "Just say you are interested in working on a hot project," says Yogesh Patel, who started as a programmer 15 years ago and is now a senior business technology consultant.

On the North American SAP AG project that he first volunteered for, Avnet provided the new SAP training and Patel became a financial leader. "My exposure was primarily on the mainframe side," Patel says. He also acquired his MBA through Avnet's tuition-reimbursement program. Now, he's leading teams that have implemented SAP at the company's sites in seven Asian countries, with China next.

Going global was part of the fun for Andrew Horton, who majored in a combination of geography, computer science and economics in college. He's now technical products manager for geographical information systems at Autodesk Inc. in San Rafael, Calif., where he sees all the software that manages workflow and design for use in government and telecommunications infrastructures. By integrating the Internet into design, Autodesk creates more interactive and intuitive tools for the iDesign process.

Horton says he always liked maps and travel — he got his private pilot's license while in high school. Now, he's involved with challenges like mapping the infrastructure of London's water system and the fiber-optic, water and sewer lines in Northern California, so that all relevant parties can have access to the information, even out in the field.

"Mobile stuff is the fastest-growing area," Horton says. The complexity of these systems and the number of customers can only be satisfied with sophisticated IT systems.

Horton says he also liked riding around in the phone company trucks for the project. "We're transforming business by design," he says. Applications have spun off into other businesses on the Web, like Buzzsaw.com Inc. in San Francisco and RedSpark Inc. in San Rafael, which allow individuals and businesses direct access to solutions for their business problems.

"The paradigm we've adopted at Hewitt is, 'More Information to More People in More Ways,' " says Perry Cliburn, CIO at Lincolnshire, Ill.-based Hewitt Associates LLC. "One of our competencies is taking new technologies and packaging them in competitive ways."

That means IT professionals customize and tailor new systems to support companies in all kinds of benefits administration. Hewitt is the nation's largest human resources outsourcing provider, Cliburn says, offering major benefit delivery programs to 12 million employees. Their work spawns new product lines like Compensation Center, which launched recently to allow companies to explore ways of handling benefits.

> *Your Web site is only as good as the product that ends up inside the customer's house. We want to be the engine that's powering the action behind the scenes of the glamour of the Web site.*
>
> ROSEANN LUCAS, TECHNICAL DELIVERY PROJECT MANAGER, EOS

Mike Kubas, a Lotus Notes LAN administrator, says he knew that Lotus' SameTime application would give Hewitt a business advantage as soon as he saw it at a Lotus Development Corp. fair. "It's a way for Hewitt Associates to collaborate in real time," he says. "It's like having 11,000 associates in your office, even though they are really in more than 75 locations in 30 countries."

The challenge is keeping it contained as a pilot. "As people hear about it, they want it," he says. The scheduled fiscal 2001 rollout may be accelerated by popular demand. After working on the project for the past year, Kubas says he expects to lead the rollout.

Willard is a freelance writer in Los Osos, Calif.

Top 10

Best companies to work at in IT for hot projects:

Rank	Company name
1	Autodesk Inc.
2	Avnet Inc.
3	Cisco Systems Inc.
4	Computer Associates International Inc.
5	Electronic Data Systems Corp.
6	Hewitt Associates LLC
7	Hewlett-Packard Co.
8	NCR Corp.
9	State Street Corp.
10	Intel Corp.

These top 10 companies are dedicating the most resources to:

- Internet application development
- E-commerce
- Enterprise resource planning
- Data center and server management
- Help desk/user support

Projects on time/budget:

- 75% or greater

Acquisition strategy:

- Order new technology on or before the announcement date and install the newest release as soon as possible

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FINANCIAL & BUSINESS CONCEPTS IN BRIEF

Business Continuity Planning

BY TAMARA WIEDER

YEARS AGO, if a hurricane knocked out a city's power supply, the resulting effects on businesses, while problematic, were generally surmountable. But these days, if the power goes out, a virus hits or computers crash, the results can be catastrophic: Systems go down, crucial data is lost, profits are stalled and, ultimately, business grinds to a screeching halt.

That is, unless the company has a business continuity plan in place for such an emergency.

"I think if you go back a few years, the notion of business continuity is something that wasn't really addressed, certainly not in a technological way," says Joe Butt, an analyst at Cambridge, Mass.-based Forrester Research Inc. "Once you introduce the 24-by-7 notion into the world and begin to look at larger and larger percentages of your sales beginning to occur in that world — as opposed to the old world, which was more 9 to 5, and you had all night to deal with issues — then the business continuity and continuance and disruption issues become far more important."

John Hickey, vice president and chief technology officer at Nasdaq Stock Market Inc., says he clearly understands the stakes involved. If Nasdaq's computer systems were to fail, says Hickey, "it would disrupt the financial markets of the country and the world."

Nasdaq faced several technical glitches this spring, from a brief inability to update quotes to capacity-related delays during record trading.

But because of its business continuity plans, the stock exchange has managed to avoid any major catastrophes for years, says Butt. The main reason is that it has a Unisys Corp. mainframe computer system based at its data center in Trumbull, Conn., and a backup system in place in Rockville, Md., says Hickey.

"Fortunately, we've only had to invoke [the backup site] once since I've been here," he says.

On Aug. 1, 1994, Nasdaq's Trumbull site experienced a dip in its outside power source. The company's uninterrupted power supply detected the problem and kicked in. But as technicians worked to connect the generators, the backup system failed, too. Suddenly, Nasdaq's uninterrupted power supply became, says Hickey, "a sometimes uninterrupted power supply."

As a result, Nasdaq made key changes when it was building a new backup system in Rockville in 1998, increasing its uninterrupted power supply systems from one to four, adding generators and bringing in a second utility feed from another geographic area.

"We're adding more equipment up here this summer. We're adding an additional generator," says Hickey.

Nasdaq also has emergency plans in place should a burricane, flood or other natural disaster wreak havoc on one particular area.

"If a local office was closed down, there is a procedure whereby adjoining states or offices would pick up the workload," Hickey explains. "There's always coverage for the investor. It's a very comprehensive plan."

Life-or-Death Stakes

Like the stock market, health care is another industry in which staying ahead of the business continuity planning game is crucial. In a hospital, a system failure could potentially result in compromised patient care.

"It's rare that a computer will fail so completely that you cannot repair it by repairing a part," says Tom Coffey, director of network engineering at Cambridge Hospital in Cambridge, Mass. "But we do have a spare server in our data center for each model of the servers that we use.

"Additionally, if we have a disaster, we have an insurance program with the vendor of our hardware where they will provide a replacement within 24 to 48 hours," Coffey says.

The hospital also has an aggressive antivirus program and a recently completed desktop standardization project, which Coffey credits as two of the reasons the hospital was able to remain relatively unaffected by the recent influx of viruses.

Too Often an Afterthought

Business continuity planning isn't just about making sure systems are up and running.

"The issue is whether I'm up, and it's also how well I'm doing," Butt explains.

But analysts still say they see many businesses waiting until faced with a problem to address the issue.

"It's quite often an event that really prioritizes it," says Stan Lepeak, a vice president at Stamford, Conn.-based Meta Group Inc. "You know, key people leave, or there's a trade or patent dispute, or there's a systems crisis. That's really what spurs people to accelerate and maybe formalize the effort more."

Once companies do decide to establish business continuity plans, they would be wise to follow the examples of those companies leading the charge, says Butt.

"Some of the poster children are companies like Dell, Intel and Amazon," he says. "Unless the entire Earth is blown up, they'll be able to continue to operate."

Wieder is a Boston-based freelance writer. Contact her at twieder@bigfoot.com.

DEFINITION

Companies use **business continuity planning** to ensure that they are able to continue operating in the event of a technical failure or other emergency.

THIS NASDAQ STOCK MARKET Unisys mainframe data center in Trumbull, Conn., has a backup located in Rockville, Md.

Better Safe Than Sorry

Ian Charters, director of U.K.-based Continuity Systems Ltd., advises companies to develop a business continuity plan that documents which organizational functions are critical, what steps are necessary to survive without them and what resources are available to help recover lost or damaged systems.

The following are some smaller steps that companies can take to minimize risk:

- Store computer systems in a safe, restricted area
- Run virus checks on PCs and firewall connections
- Change locks and passwords when employees leave their positions
- Remove flammable waste and clean drains
- Route cables to avoid single points of failure
- Negotiate maintenance contracts that guarantee quick response and replacement
- Get a backup generator
- Use surge suppressors and uninterruptible power supplies

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JOE AUER/DRIVING THE DEAL

Who gets the risk? And who ducks it?

IF YOU WERE HANDED A SUPPLIER FORM CONTRACT that discussed — ad nauseam — what the vendor *won't* do, do you think the hair on the back of your neck might stand up? It did recently for one buyer. He works for a global consumer products company, and he received a proposal from a vendor to support the company's AS/400-based applications.

The deal would allow the vendor to host the applications and provide the hardware, operating systems and operations and technical support personnel. The customer would provide the application software licenses and make arrangements for all required data circuits between the vendor's and customer's locations. But the vendor's 16-page contract for these services focused on what the vendor *wouldn't* do, rather than on what it would.

The customer immediately realized there was a problem. After all, when the vendor goes to great length to tell you what it won't do, there's reason to be cautious.

There were many other problems with the agreement, the most important being a lack of definition of what the vendor actually *would* do. All the vendor was agreeing to provide was "application hosting services" — and that was the total description of the deliverables. The customer was responsible for everything else — including the risk.

The vendor would assume no liability — not even responsibility for its own nonperformance. The cootract amounted to one big "get out of jail free" card for the vendor to tuck up its sleeve.

Without a well-defined description of services and appropriate measurable service levels, the customer would be forced to accept whatever service the vendor chose to offer.

There was no methodology to measure and report performance — just whether the system was up or down oo a particular day.

The vendor's only performance requirement was to make the application "generally available."

There was no specified remedy if the application waso't "generally available," eveo if the parties agreed oo just what that meant.

Another glaring omission from the contract was a list of clear and specific warranties. The vendor was only willing to warrant that there were no contractual obligations that would preclude it from entering into the contract.

Again, there was no remedy if the vendor breached this clause.

What about warranties for intellectual property infringements, third-party indemnifications, nonconforming services and data regeneration? They were all absent, with the customer being exposed to huge liabilities for the other party's behavior.

While there were many other deficiencies, the absence of well-defined deliverables, performance guarantees, meaningful remedies and sufficient warranties was enough for the customer to insist on significant contract improvements — or to seek another prospective vendor.

Negotiations and a search for for an alternative vendor are continuing.

Joe Auer is president of International Computer Negotiations Inc. (www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High Tech Acquisition Professionals. Contact him at [illegible]

Save yourself time and risk in a deal by getting the potential vendor's contracts *before* you select a vendor, and try to answer these questions about each proposal:

- Does the contract clearly describe the results you need?
- Does the vendor warrant that it will deliver those results?
- What remedies are available to you if the results aren't achieved?
- Does the contract contain all the vendor representatives you relied on?
- Does the contract show that the vendor has confidence in its ability to perform?
- What triggers your obligation to pay the vendor? Proven results? Or something relatively meaningless — like whenever the vendor says you must pay?
- If you later realize that the deal isn't working, will you be able to explain to your senior management why you made this deal — and still be employed?
- Would disinterested third parties (read: jurors) be able to understand every aspect of the deal by looking at the contract?

We need to focus on having our contracts clearly and completely describe both parties' rights and obligations and actually describe the deals we've done.

IT is too critical to have both vague customer expectations and unquantified vendor representations in the same deal.

BRIEFS

Dell and Red Hat's Ties Grow Stronger

Dell Computer Corp. stepped up its relationship with Red Hat Inc. The companies will engage in joint engineering efforts, and Durham, N.C.-based Red Hat will handle services and support for Dell customers. Round Rock, Texas-based Dell said Linux is now one of its three strategic server operating systems, together with Windows and NetWare.

AOL Gets Into TV

Forget about reruns. This summer, Dulles, Va.-based America Online Inc. plans to roll out AOLTV, which allows television viewers to send instant messages and surf the Web, all from a set-top box. Priced at $249 – and made by Eindhoven, Netherlands-based Koninklijke Philips Electronics NV – AOLTV lets viewers watch a television show and chat with a friend in another city, using the Internet as their connection. The target market for the device is AOL's existing membership. The company has 23 million subscribers.

AOLTV will compete with WebTV Networks Inc., a Mountain View, Calif.-based Microsoft Corp. subsidiary that's starting a service designed to allow viewers to play along with TV game shows.

Monster.com Names President

Online job board Monster.com in Maynard, Mass., appointed Hans Gieskes as its president. The former CEO of information services firm Lexis-Nexis in Miamisburg, Ohio, Gieskes will report to Monster CEO Jeff Taylor.

EMC Hires AT&T CIO, Promotes Hauck

Hopkinton, Mass.-based storage company EMC Corp. named Alan G. Jones as its senior vice president of technology services. He will oversee its Internet Solutions Group and several of the company's e-commerce initiatives. Jones was AT&T Corp.'s CIO for the past three years prior to joining EMC.

EMC also promoted Frank Hauck to the position of executive vice president of products and offerings. He will be responsible for the engineering, manufacturing, product management, strategic planning and corporate quality organizations.

The company said it plans to invest nearly $2 billion in research and development during the next two years.

Hauck has served as senior vice president of customer service, vice president of worldwide technical support and director of global sales operations, among other positions at EMC.

Banking Services Provider Buys 2 Firms

Brokat Infosystems AG in Stuttgart, Germany, last week acquired GemStone Systems Inc. for $271 million and Blaze Software Inc. for $561 million in two stock-for-cash deals.

San Jose-based Blaze develops an application infrastructure rules engine.

Beaverton, Ore.-based GemStone develops a Java applications server.

Brokat is producing an infrastructure platform for developing Web applications primarily for the banking sector and plans to continue operating the development facilities at both firms.

Sun Exec Takes the Helm at FireDrop

FireDrop Inc. in Redwood Shores, Calif., recently landed former Sun Microsystems Inc. executive Alan Baratz as its CEO. FireDrop makes Zapletz, a hybrid messaging technology that allows users to interact with content in Web pages.

Baratz will succeed co-founder David Roberts, 38, who will remain with the company. Baratz, 45, will join FireDrop July 10. His mission is to expand the market for the messaging technology.

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TECHNOLOGY

INTEROPERABLE?

Truly interoperable hardware and software may be a step closer to becoming a reality. Last week, the Distributed Management Task Force released new directory standards, and vendors have sped up interoperability testing. ▸ 82

IMPOSING ORDER

The Common Warehouse Metamodel standard, approved last week by the Object Management Group, should provide a common way to describe a database's structure in preparation for incorporating it into a data warehouse, say the standard's backers. ▸ 82

WAY WIRELESS

Hoping to expand the capability of wireless devices to perform mission-critical functions, IBM has released a version of its MQSeries message-oriented middleware that operates on mobile networks. ▸ 85

HIGH-SPEED, LOW-TECH

3Com has rolled out high-speed service over copper wires, negating the need for infrastructure upgrades. The company is alone in this space, but how long will it dominate a beckoning market? ▸ 85

Q&A: GOSLING ON JAVA

Five years after unleashing the Java development language, Sun's James Gosling discusses his creation. Among his comments: He says it would be "insane" to turn Java over to a standards body. ▸ 86

QUICKSTUDY

When your business grows and outstrips your computer system's processing abilities, you need to know how to add more power — fast. Learn about scaling up and scaling out. ▸ 90

FUTURE WATCH

A zooming user interface could provide a new way to navigate desktop directories — no more clicking through hierarchical data directories or scrolling through pull-down menus. ▸ 92

CAN'T WE WORK TOGETHER?

Overseas competition is driving Lucent and other companies toward distributed software development. To smooth its global development efforts, Lucent is pioneering techniques to improve collaboration across sites. The results are mixed. ▸ 94

LEARNING ONLINE

Web-based training is popular because it's cheaper than classroom training during work hours. But it can be hard to track and manage, especially when users just dip into courses for a quick answer. ▸ 86

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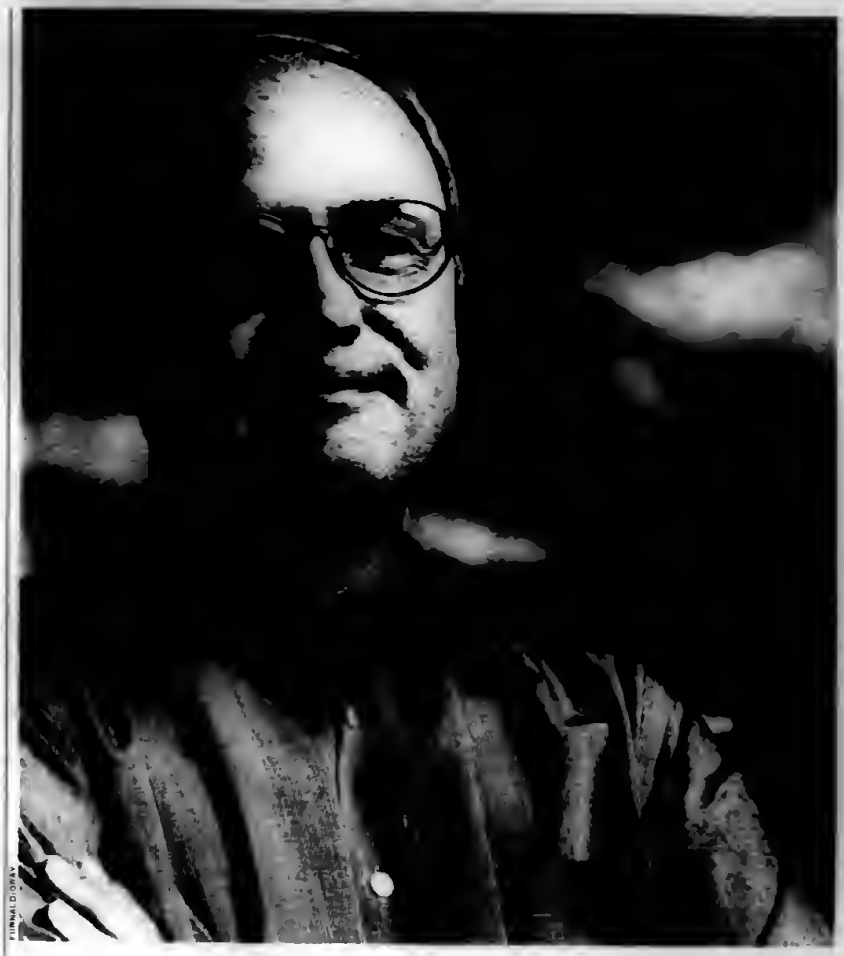

FIRNAL DORAY

PRESENTATIONS: EASING THE PAIN

START-UP BRAINSHARK INC. wants to relieve corporate IT of the task of creating, distributing and organizing multimedia presentations, by allowing in-house experts to manage their own documents. It's a great idea, but the very simplicity of this service raises the question of how long the company can stay ahead of the competition.

100

New Standards Boost Interoperability Hopes

Directory-enabled, network-compliant systems are goal of testing, mapping efforts

BY SAMI LAIS

THE VISION of truly interoperable hardware and software gained a bit more substance earlier this month with the release of new directory standards by the Distributed Management Task Force Inc. (DMTF) and a speedup of interoperability testing by vendors.

"We had a dozen vendors [testing] in March [and] 14 this week," said Winston Bumpus, president of the Portland, Ore.-based standards body. "I think we're very close to seeing product."

"This is what all of us have been waiting for — not just the standards, but all the vendors getting together" and doing the interoperability testing, said Arun Kant, vice president of enterprise systems management at The Prudential Insurance Company of America.

"I got six calls just yesterday from people congratulating me because this means that Prudential has been on the right track," Kant said.

Newark, N.J.-based Prudential bet heavily on the evolving standards, basing its global systems command ceoter on them. Prudential manages its worldwide applications and network infrastructure from that command ceoter.

With support from vendors such as Cisco Systems Inc. in San Jose, the standards may be reaching critical mass for industrywide acceptance, said Corey Ferengul, an analyst at Meta Group Inc. in Stamford, Conn.

Better Mapping

The Lightweight Directory Access Protocol (LDAP) makes it easier for devices and systems to share data in directories, which are lists of people, computers and users in an organization.

The Common Information Model (CIM) is a framework for how systems and their components interact.

Integrated into information technology products, DMTF's CIM-to-LDAP mapping guideline and its new LDAP mapping for CIM core and physical schema would make possible directory-enabled network-compliant systems, according Bumpus.

Such systems would let any application, device or service use information in its own and any other directory.

ARUN KANT: "This is what all of us have been waiting for"

Some users, however, said they're being more cautious.

"It's interesting," said Peter Gunn, a network performance manager at United Parcel Service of America Inc. in Mahwah, N.J. "But right now, we see no direct impact of it on UPS's systems."

"We've just begun to use" LDAP, said Bill McCutcheon, a Lotus Notes administrator at Master Builders Inc. in Beachwood, Ohio. But "we're not seeing lots of directories in use so far," he added.

Dallas-based Southwest Airlines Co. has built its security infrastructure around Novell Inc.'s Novell Directory Services (NDS).

"LDAP plays a very important role in NDS," said Lee Roth, Southwest's LAN and security service manager. "Because NDS is standards-based, it doesn't tie me to any single directory."

"High on DMTF's agenda is a method of testing standards-compliance of products," Bumpus said. The test would likely be self-administered by vendors, with results posted on the DMTF site, he said.

Multivendor Group Approves Metadata XML Standard

Data-warehousing products on the way

BY CHRISTINE McGEEVER

Object Management Group Inc. (OMG), a multivendor standards oversight committee in Needham, Mass., last week ratified a standard for XML metadata for data warehousing. The group said to expect to see products supporting the standard soon (see box).

Called the Common Warehouse Metamodel (CWM), the standard is supposed to provide a common way to describe a database's structure in preparation for incorporating data from it into a data warehouse. Without such a standard, backers said, the structure of the database that feeds the warehouse must usually be changed or replaced to incorporate the data in a logical, retrievable fashion.

Bill Seagrave, CEO of software developer and consulting firm D2K Inc. in San Jose, Calif., said he wonders how widely CWM will be adopted by vendors, and how widely products supporting CWM will be adopted by users. As with other standards, "it will be many, many years" before either happens, he said. And even if the standard is widely supported in products, it won't result in plug-and-play data warehouses, he added.

Vendors, including IBM, Oracle Corp., Unisys Corp., Hyperion Solutions Corp. and Dimension EDI, submitted the specification to the OMG a year ago, and the participating vendors exhibited preproduction versions of interoperating products at OMG's meeting last fall.

Unisys fellow Sridhar Iyengar said the group examined data models used by the IBM DB2 Universal Database, Oracle8i, Unisys products and Microsoft Corp.'s SQL Server.

Microsoft has been working on its own standard, called Open Information Management, which, among other things, addresses metadata standards for data warehousing and for application interoperability.

"We know CWM will work with SQL Server," said Iyengar. Microsoft couldn't be reached for comment.

Jagdish Mirani, Oracle's senior director of marketing for data warehousing, said the lack of an XML metadata standard has delayed data warehouse implementations for all but the largest corporations that have the luxury of abundant information technology resources and personnel.

Mirani said having a metadata standard will help users build a data warehouse faster. It will also help minimize the amount of manual coding required to troubleshoot the complex process of extracting data from source databases, transforming the disparate data schemas into a more unified structure and loading the data into the warehouse.

CWM will benefit "IT folks building data warehouses and end users interpreting the data," Mirani said.

AT A GLANCE

Data Sharing

The Common Warehouse Metamodel (CWM) is a standard for shared data warehouse metadata. It was proposed by Oracle, IBM, Unisys, Hyperion and Dimension EDI. The standard's creators maintain that it:

- Addresses problems inherent to data extraction, transformation and loading, reducing the need to manually perform the tasks
- Is essential for data mining and online analytical processing across the enterprise
- Will be supported by vendors' current products, such as Oracle Warehouse Builder

NEW SUN TERMINALS RELEASED

Sun Microsystems Inc. has announced two new models of its Sun Ray thin-client devices: the Sun Ray 100 and Sun Ray 150. These models – like their predecessors – function as terminals, allowing users to access Solaris and Windows NT applications via a browser interface.

Sun said the devices reduce costs by allowing users to centralize application management, eliminating the need to maintain software on every desktop.

A technology called Sun Ray Hot Desk allows users equipped with smart cards to access applications from any Sun Ray appliance connected to the network without having to use only their own systems, Sun said.

The Sun Ray 100 features a 17-in. display with 1,280- by 1,024-pixel resolution; pricing starts at $548. The Sun Ray 150 has a 15-in. LCD flat-panel display with 1,024- by 768-pixel resolution; it costs $1,299.

– Jaikumar Vijayan

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IBM Middleware Runs on Wireless

MQSeries Everyplace ensures message delivery

BY MICHAEL MEEHAN

LOOKING TO change wireless devices from trinkets into reliable business machines, IBM has released a version of its MQSeries messaging middleware that runs on mobile phones and personal digital assistants.

Called MQSeries Everyplace, the release is supposed to provide the same level of reliability as previous versions of the software, which stores messages between applications and ensures that those messages are delivered.

The portioo of the middleware that sits on wireless devices runs oo only 60KB of memory, uses standard Web protocols such as HTTP and TCP/IP and offers up to 128-bit encryption, which is a higher level of security than in the land-based version.

To ensure message delivery eveo wheo connections break or batteries fail, the client component of MQSeries Everyplace stores messages until a connection is made and the receiving applicatioo has confirmed its arrival.

Carl Zetie, an analyst at Giga Information Group Inc. in Cambridge, Mass., said products such as MQSeries are important for guaranteeing that transactions made from wireless devices are processed by back-end servers.

MQSeries creates an object that contains application-defined content for each message and holds the messages in a queue. When a path to a land-based gateway is established, the client application breaks the object into smaller pieces for transmission and reassembles the object, along with its data, on the receiving end.

Rob Lamb, director of business integration at IBM's software unit, said wireless devices equipped with the software communicate with a server-based MQSeries gateway, from which messages can be sent to the back-end systems and which runs on Windows NT and Windows 2000. He said IBM will add support for its AIX version of Unix and Sun Microsystems Inc.'s Solaris in late September.

Several vendors are already supporting the new capabilities. Extricity Inc. in Redwood Shores, Calif., is building applications to transmit MQ wireless messages from the gateway to back-end systems. Vertex Interactive Inc. in Clifton, N.J., converts MQ messages into XML objects.

However, at least one user was skeptical. Gerry Fitzgerald, director of global messaging at Philadelphia-based pharmaceutical manufacturer SmithKline Beecham Corp., argued that wireless applications are still tied to the limited reach of wireless networks. "Until the U.S. catches up with Europe oo establishing some standards, I'd be hesitant to do a whole lot with wireless," he said. "And I doo't really see that happening in the next five years."

Microsoft Corp. has a wireless version of its messaging middleware, but Zetie said it only supports Microsoft's Windows CE operating system. MQSeries Everyplace provides wider support for wireless devices, he added.

Zetie said Everyplace avoids some of the challenges and complexity of earlier versions. The application programming

interfaces provided with MQSeries Everyplace "are simple," Zetie said. "It's basically 'send, get and read.'"

Everyplace costs $3,000 to $6,000 per gateway license.

3Com Goes High-Speed, Low-Tech

Copper phone lines to add seamless broadband

BY JENNIFER DISABATINO

Companies are tripping over themselves to offer Internet access at light speed, but 3Com Corp. is moving in a different direction.

Last week, 3Com launched its Visitor Community Network (VCN), which uses copper-wire telephone lines to provide value-added broadband Ethernet services to hotels, multitenant offices and apartment and condominium complexes.

The VCN carries voice, video and data packets over existing copper wires at speeds of 10M bit/sec. for up to 4,000 feet without any infrastructure upgrades and without adding software to a user's desktop, 3Com officials said.

"I think 3Com's entry into that market is a good one because right now no one else is in that space [over copper wires]," said analyst Kurt Scherf at Parks Associates in Dallas. "I think it's a no-brainer for the many existing buildings out there."

The company has deals with three firms that have agreed to offer the VCN technology to their phone clients. One of those, Cincinnati Bell Telephone, has bought into the 3Com technology, which it is marketing heavily to small and medium-size businesses that are looking for speed on old infrastructures.

Jim Dattilo, marketing director of core business services at Cincinnati Bell, said his firm will also market 3Com's technology to large schools and hotels. "This can extend to all these customers," he said. "The three [other] vendors I don't think have the technology."

3Com should, however, be looking over its shoulder.

True to its name, Copper Mountain Networks Inc. in Palo Alto, Calif., is also working on squeezing more bandwidth out of copper wires.

"Copper Mountain Networks is also going to be a player with the small to medium side," Scherf said.

"If you're going to compare technologies, there's still no comparisoo to the bandwidth that's available with fiber-optic lines," Scherf said, but he added that most users doo't need speed beyond what 3Com is offering.

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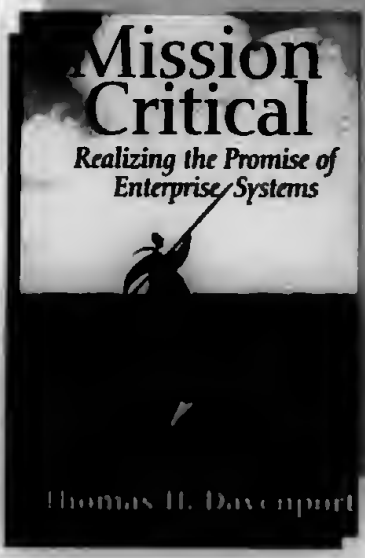

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IBM Goes Everyplace

The new MQSeries Everyplace wireless messaging middleware looks to give mobile devices the same performance reliability as land-based machines. Its features include the following:

- **Runs on laptops, PDAs and mobile phones.**
- **Provides immediate server or mainframe interaction when a link is available and queues messages for later delivery when it's not.**
- **Ensures messages are delivered only once.**
- **Uses HTTP to punch through firewalls and offers 56- or 128-bit security encryption.**
- **Enables automatic transmission of messages from other servers to mobile devices.**

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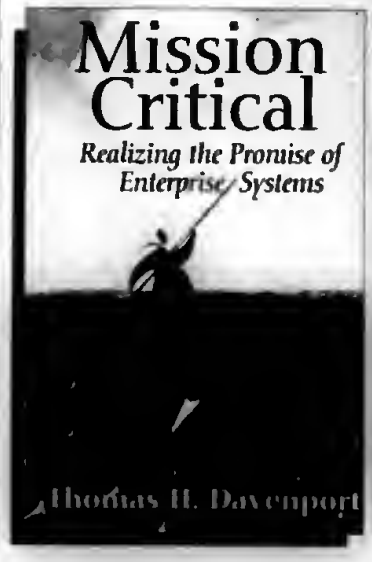

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Gosling: 5 Years on, Diversity of Java Has Been Surprise

Five years after unleashing the Java programming language on the world, Sun Microsystems Inc. Vice President **James Gosling** spoke with reporter Carol Sliwa about how his brainchild has fared.

Q: Where is Java going to be most important, going forward?

A: In the sociology of developing [applications]. There's this marketing slogan that Sun has used a lot: "Write once, run anywhere." I like to use the flip of that, which is "Learn once, work anywhere." I don't know how many people I've talked to that have beeo doing projects where [they've] got the teller terminals, the big databases for the bank, the ATM systems. All of these things are interconnected, and they can actually write the whole system in Java, but it runs everywbere. The tcam can work everywhere.

Q: What's been the biggest surprise for you in terms of Java's direction?

A: Diversity — things like the way the smart-card stuff has just gone bananas. Giveo the history of smart cards in the U.S., I didn't think that mucb would happen. It took me a while to really accept that the rest of the world is much more sensible than the U.S. is.

Q: Do you think there's a future for Java on the desktop?

A: When we started this, we were really pushing Java and applets and Web browsers. . . . That all sort of crashed and burned and got ugly. [Then we were] mostly paying atteotion to the server, and that was an area where the platform was alive and healthy and Java really, really worked out well.

But — and this is something that I've kept arguing with people at Sun about — you know we have done these APIs for people doing desktop applications. The principle ooe has been this thing called Swing [for creating graphical user interfaces], and if you look at the density of mail that we get on it and the oumber of books that are published on it . . . there's a lot of interest.

People that were inside organizations were using Java all over the place to build desktop apps, all kinds of specialized stuff, and what tended to drive that was mostly it's an incredibly productive environment. They get stuff done really quickly, and it tends to be fairly reliable, at least relative to anything else, and it scales up.

Q: Sun abandoned efforts to standardize Java through two standards bodies, the International Standards Organization and ECMA. Do you think Sun's Java Community Process (JCP) represents the proper way to evolve the language?

A: It's certainly the best way I can think of. I mean, we've been involved in opeo-source projects, in proprietary projects, in every consortium you can imagine, in standards committees left, right and center. So we've tried pretty hard to take the bits and pieces from different processes we thought actually worked pretty well and put them together in something coherent.

But you know, we got all these accusations of favoritism. ... One of the things behind the JCP was writing down what we thought *fair* meant.

Q: IBM, in particular, still complains that Java should be turned over to an independent standards organization.

A: That has become very clear it would be completely insane. ... Standards bodies are unbelievably political. We've made a couple of runs at it, and they all turned into a shambles. And talk about hackroom dealing.

The other problem is that all of these standards committees are basically vaults into which you put paper. On the way in, they get a stamp on them and there's absolutely no ootion of what

JAMES GOSLING, Sun Microsystems vice president and creator of the Java language

conformance to a standard means. And for us, it's really important that if somebody says this is a Java [virtual machine of] this type, that developers have an expectation that their programs ought to bloody run.

Q: Is Microsoft still viewed as a threat to Java?

A: To be honest, for the last year, year and a half, in terms of the Java world, Microsoft hasn't been a problem. I mean, they were so outrageous, the developer community saw through them, didn't believe them, and to be honest, [Microsoft has] heen kind of preoccupied.

Q: You served on the first JCP working group, which created a real-time Java specification to help developers who need Java to be predictable and reliable enough for medical devices and robot arms. What was that experience like?

A: It's just a really weird and interesting group of people to hang out with. I certainly got a refresher course and new appreciation for what that world is like. I also got a real appreciation for how the JCP was going to work. It was kind of an experiment, and it actually worked really well.

It also got me thinking really hard about all kinds of reliability issues and about [how] the stuff we're doing today is serious.

BRIEFS

Intel Releases New Processors for Mobile PCs

Intel Corp. last week introduced five mobile processors for full-size, thin, light and ultra-portable notebook PCs. Intel also extended its low-power technologies with these processors, including the first mobile Intel Pentium III processor that consumes less than 1W of power on average.

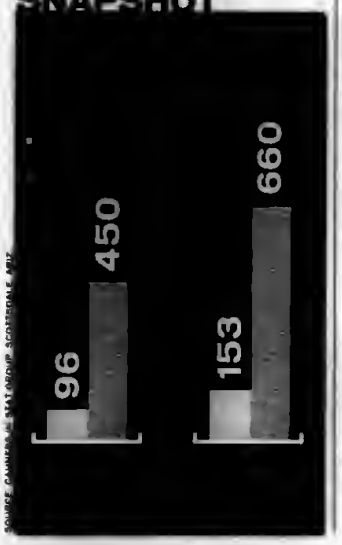
The mobile Pentium III processor with Intel SpeedStep technology operates at 750 MHz. The low-power mobile Pentium III 600-MHz processor features Intel SpeedStep technology and ultralow-voltage operation. The processor operates on only 1.1V and consumes less than 1W of power in Battery Optimized Mode, on average. Intel also introduced mobile Intel Celeron processors at 650 and 600 MHz. A 500-MHz mobile Intel Celeron processor offers 1.35V operation to enable ultra-portable mobile systems.

Pricing for the Mobile Pentium III Processor is $562. The Low Power Mobile Pentium III Processor costs $316, the Celeron Processor at 650 MHz costs $161, the Celeron Processor at 600 MHz costs $134 and the Low Power Mobile Celeron Processor at 500 MHz costs $134.

IBM Developing InfiniBand Chips for Multiple Devices

IBM is developing a series of chips based on a technology called InfiniBand that will help link multiple computer systems and peripheral devices so they can work together as one server. InfiniBand is a standard being developed by an industry body in Portland, Ore., called the InfiniBand Trade Association. The group comprises server, peripheral equipment and networking manufacturers and is led by Compaq Computer Corp., Dell Computer Corp., IBM, Hewlett-Packard Co., Intel, Microsoft Corp. and Sun Microsystems Inc. The first IBM products based on InfiniBand are expected to be released next year and will include a host channel adapter, a target channel adapter and a switch.

SNAPSHOT



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MechanicNet Rolls Out Web Service for Auto Repairs

MechanicNet.com Corp. in Fremont, Calif., has launched a Web-based service for scheduling automotive services and repairs. The site offers an automated reservations system and online maintenance records for vehicle owners. It also offers aftermarket parts procurement to automotive dealers and collision repair shops.

IBM Releases Hard Drive To Triple Handheld Storage

IBM has announced Microdrive, a 1GB hard drive that provides triple storage capacity for handheld computer devices. The product is about the size of a quarter and can hold up to 1,000 novels of 200 pages, 1,000 high-resolution photographs and almost 18 hours of high-quality digital music, according to IBM. Microdrive can also be used as a data exchange accessory for printers, desktop computers and notebook computers. Limited quantities of the product are scheduled to ship next month to original equipment manufacturers for less than $500; retail release is scheduled for September.

Lucent Teams Up With Mirror Image

Lucent Technologies Inc. in Murray Hill, N.J., and Mirror Image Internet Inc. in Woburn, Mass., are teaming up to develop and market Internet content-delivery and distribution products. The two companies will combine Mirror Image's proprietary Content Access Points technologies with products from Lucent's Bell Laboratories division to develop technologies for boosting the distribution of high-bandwidth and graphic-intensive content over the Internet. Mirror Image is owned by holding company Xcelera.com Inc. in the Cayman Islands and is backed by companies such as Santa Clara, Calif.-based Exodus Communications Inc. and Hewlett-Packard.

Consortium Launches Online XML Tech Warehouse

The Organization for the Advancement of Structured Information Standard (OASIS), a new consortium comprising several technology firms, has launched an online warehouse created specifically for XML technology. The Billerica, Mass.-based nonprofit group includes Oracle Corp., Sun and IBM. OASIS has created a Web portal site, XML.org, which will be used as a library for XML vocabularies. The library will house the XML vocabularies from vertical industries that are dealing with e-commerce and data exchange. The goal of the consortium is to link its library with the libraries of various companies and industry organizations, such as Object Management Group Inc. in Needham, Mass., ultimately connecting all of the Web content-tagging language repositories.

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Lucent Technologies Inc. in Murray Hill, N.J., and Mirror Image Internet Inc. in Woburn, Mass., are teaming up to develop and market Internet content-delivery and distribution products. The two companies will combine Mirror Image's proprietary Content Access Points technologies with products from Lucent's Bell Laboratories division to develop technologies for boosting the distribution of high-bandwidth and graphic-intensive content over the Internet. Mirror Image is owned by holding company Xcelera.com Inc. in the Cayman Islands and is backed by companies such as Santa Clara, Calif.-based Exodus Communications Inc. and Hewlett-Packard.

Consortium Launches Online XML Tech Warehouse

The Organization for the Advancement of Structured Information Standard (OASIS), a new consortium comprising several technology firms, has launched an online warehouse created specifically for XML technology. The Billerica, Mass.-based nonprofit group includes Oracle Corp., Sun and IBM. OASIS has created a Web portal site, XML.org, which will be used as a library for XML vocabularies. The library will house the XML vocabularies from vertical industries that are dealing with e-commerce and data exchange. The goal of the consortium is to link its library with the libraries of various companies and industry organizations, such as Object Management Group Inc. in Needham, Mass., ultimately connecting all of the Web content-tagging language repositories.

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REPRODUCTION IN WHOLE OR PART IS FORBIDDEN BY LEGAL STATUTES, BUT WHY BOTHER WHEN YOU CAN RIP THIS PUPPY RIGHT OUT AND TAKE IT WITH YOU?

On Track And in Touch

You want it WHEN? By Howard Millman

COMPLETING A PROJECT successfully depends on two elements. The first is the unrestricted sharing of information. By structuring and easing the flow of information and ideas, project management applications promise to keep projects on target and within budget while reducing errors and the number of gray hairs caused by miscommunications.

If effective communication is one-half of the success equation, the other half is applying effective technology. Microsoft Corp.'s Project 2000 and Bala Cynwyd, Pa.-based Primavera Systems Inc.'s SureTrak 3.0 project management applications can help you initiate, track and control information. Be prepared to invest several hours to learn — up to three days to master — either of these applications.

Aside from the acquisition price of the software — about $500 per seat — the decisioo to implement project management software also depends oo the complexity of the project. What benchmarks can you use to tell when it's time to abandoo your magnetic wall chart? You will probably see a return on investment when your project involves a dozeo or more people (some located remotely), 100 or more sequential tasks and projects that have a "critical path" — a workflow model where time-sensitive, interdependent eveots must occur in a specified sequence.

Either Project 2000 or SureTrak will competeotly plan and manage a variety of projects, such as an enterprisewide software upgrade or the coordination of a move into a oew building. Likewise, both are equally adept at handling knowledge-based projects, such as marketing campaigns, as well as more tangible ventures, such as the construction of a building.

While SureTrak's extensive use of wizards makes it moderately easier to learn than Project 2000, Microsoft offers a better overall value, a more intuitive design — especially for users of its Office suite — and a richer set of Web-based remote access features. Overall, it's more than worth the slightly extra ramp-up effort.

Tracking Tasks, Time and Budget

Under limited circumstances, text-based groupware and scheduling applications such as Lotus Notes and Microsoft Exchange are alternatives to traditional project management applications. Groupware applications provide an adequate communication channel; however, they lack the organization imposed by SureTrak's and Project's structured forms. Likewise, they lack scheduling engines capable of managing cascading dependencies. For example, if the delivery date of a new server slips by, these engines will automatically delay every task associated with the new server, like installing additional cabling.

Knowledge is power; shared knowledge is power on steroids. Improving the flow of information among employees while achieving greater collaboration with customers, suppliers and partners will happeo only if stakeholders can collaborate whenever they need to, wherever they are.

Project 2000, along with its Web-based companion product, Ceotral, expertly meets that requirement. It allows remote team members, suppliers, partners and anyone with an interest in the project's successful completion to view the project and modify their own tasks via the Web. For example, users can input time sheet information, submit status reports and create and delegate tasks. Executives can also create a Portfolio view to determine the status of all projects under way as well as drill down for detailed descriptions of key events.

In addition to Project Central's $199-per-seat license, remote users require only an Internet Explorer browser, Versioo 4.01 or later. They need not have Project 2000 installed oo their desktops. This means reduced acquisition costs and less maintenance complexity.

SureTrak uses the Web for the distributioo of HTML-formatted reports, but it's strictly one-way, pushing informatioo out to the clients. Primavera's Webster, a $250-per-seat companion product, provides the equivalent interactivity found in Project Central. SureTrak's other attributes include well-designed tutorials and Project KickStart Wizard, which provides fill-in-the-blank simplicity for brainstorming and creating new projects. Another wizard streamlines the process of adding projects into an existing group. SureTrak works with Internet Explorer and Netscape browsers. ▶

Millman operates Data System Services LLC, a consultancy in Croton, N.Y. Contact him at hmillman@ibm.net.

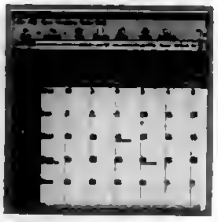
Project Management On the Lite Side

If you're looking for an alternative to a full-featured project manager, consider **eProject Express from eProject.com Inc.** Entirely Web-based, free and independently hosted, eProject's open architecture and clear navigational aids make it a no-brainer to learn and use. Ramping up should take less than five minutes for first-time users. But simplicity has its downside: eProject lacks advanced features such as resource leveling, bar and Program Evaluation, and Review Technique charts, as well as the multidimensional data analysis tools available in Project and SureTrak.

Another concern you might have with eProject Express and its competitors, such as Washington-based IntraActive Inc.'s InTandem and Lotus Development Corp.'s QuickPlace, is how well you can sleep nights knowing your project's information is sitting out there on the Web.

EProject Express' strength is its real-time interactivity and simplicity, which makes it suitable for anyone who has Internet access, from any browser. It requires no downloads or the installation of additional hardware. Since it's hosted by the application service provider, eProject.com, it consumes no internal network resources or server capacity and makes no demands on the IT department for implementation or maintenance.

For larger projects involving more than five people and two dozen or so resources, online solutions may not be the wisest choice – yet. But the Web-hosted application service provider model will likely grow more robust over the next few months. For example, eProject plans a major upgrade this month. If eProject's current limited feature set might satisfy your needs, it's worth looking into. – *Howard Millman*



EProject Express from eProject.com

Project 2000

Microsoft Corp.

www.microsoft.com/project

COST: $499 with a one-user Project Central license

UPGRADE: $199

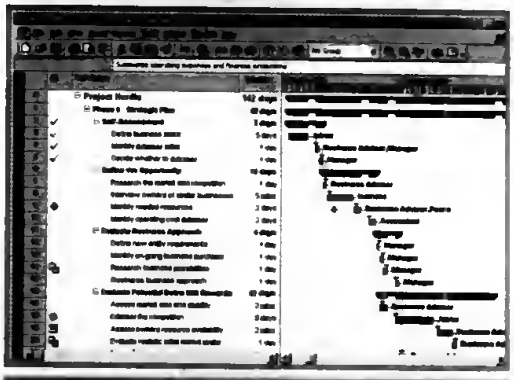
Highly recommended. An all-around excellent value that's well-suited for professional and novice project managers and planners. It offers a comprehensive array of project management, data analysis and communication tools. This release is easier to use and offers better database performance than its predecessor, Project 98. Bundled with Microsoft's lightweight Data Engine database, Project 2000 also runs on Microsoft's Access and SQL 7 databases, as well as Oracle Corp.'s databases.

PROS:

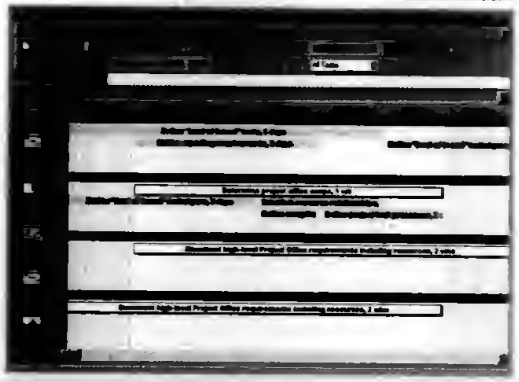
- Offers excellent control over tasks, resources and budgets.
- Tasks and report progress are accessible via the Web through Project Central, making anytime, anywhere, anyone access a welcome reality.
- Allows flexible viewing of project data.
- Numerous add-ins are available from third-party vendors, providing job-cost accounting and enhanced scalability.
- Integrates with Microsoft's Office suite to simplify moving data into Excel or Access for more advanced data analysis and presentation options.

CONS:

- Microsoft-centric in design, Project Central requires Windows 2000/NT 4.0 and Internet Information Server. Remote users must use Internet Explorer browsers.



◂Project 2000's Gantt chart



◂Project 2000's calendar

SureTrak 3.0

Primavera Systems Inc.

www.suretrak.com

COST: $499

UPGRADE: $99

Recommended. A solid performer offering all expected team-building, communication and "what-if" features required for single and multiple project management endeavors. Runs on Open Database Connectivity-compliant databases.

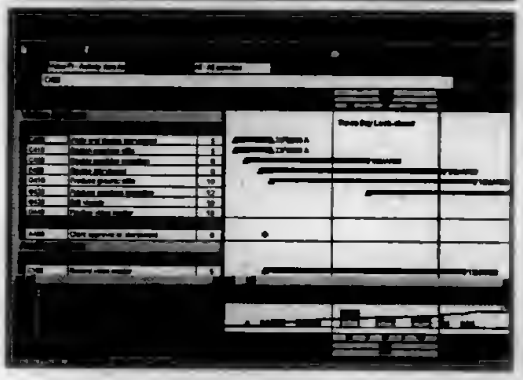
PROS:

- Works with multiple browsers.
- Offers a wide selection of canned and ad hoc reports.
- Integrates with Microsoft's Excel for cross-tab data analysis options.
- Wizards automate common tasks, such as project start-up, multilevel viewing and Web-based information distribution.
- Variable timescales feature allows users to vary time increments for selected portions of a project.
- Flexible display options help with the assimilation of complex data.

CONS:

- Lacks full Web-based interactivity; limited to Web-based distribution of HTML reports. Webster, an optional add-in that I didn't test, provides similar features to Microsoft's $199 Project Central.

◂SureTrak's Program Evaluation and Review Technique chart

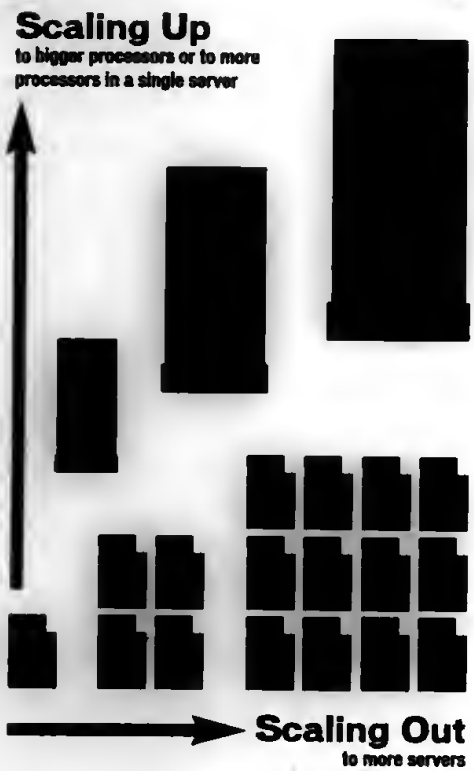


◂SureTrak's multi-faceted display

Scalability

DEFINITION

Scalability is the capability of increasing the computing capacity of a Web site or a computer system — and the site's or system's ability to process more operations or transactions in a given period, in particular — by adding more, or more powerful, processors. Traditionally, scalability has been achieved by adding or changing to one or more large multiprocessor servers. A somewhat different, newer strategy is to add more (often many more) smaller servers.



BY STEVE ALEXANDER

A BUSINESS starts with a particular set of computing needs. If it grows, the organization needs to be concerned about the scalability of its computer systems.

Scalability is a good thing, because it means you don't have to start over and build a completely new system with new software and hardware. With a scalable system, you will likely keep running the same software and merely add more hardware. There's nothing new about this idea, but the arrival of e-commerce has changed the way businesses go about — and think about — scaling computer systems.

Up or Out?

Two terms characterize the two strategies for scaling: *scaling up* and *scaling out*.

Scaling up is the traditional approach: Instead of a small server, get a bigger, multiprocessor server (or a cluster of them). If that's not enough, maybe you need or want a mainframe or perhaps even a supercomputer.

One problem with this approach is that it takes time. In today's e-commerce environment, long-range planning and efficiency may matter less than being able to hring a new application online quickly. Therefore, you might want to try scaling out, which is a relatively fast and easy approach that involves buying a bunch of inexpensive, commoditized server boxes.

Neither of these approaches is inherently better than the other; each has its own advantages. And today, e-commerce firms are adopting pragmatic growth strategies that call for both scaling up and scaling out. As the number of transactions and site visits increases, Web servers and application servers are being scaled out with the addition of other small servers that run multiple copies of Web or application software. Meanwhile, back-end database servers are being scaled up in a slower, more deliberate way, with large, multiprocessor servers running a single copy of the database software.

Brian Richardson, an analyst at Meta Group Inc. in Stamford, Conn., says it's feasible to scale out Web and application servers because there's no need for each transaction to take place in a single copy of the application. Database servers, however, work better when running a single instance of the application. This prevents transactions from running afoul of one another — for example, a retailer doesn't want to promise delivery of an item that isn't available in inventory.

Richardson says the "rack-and-stack approach" of scaling out Web and application servers with one- or two-processor units is both simple and cheap. "The big driver here is not total cost of ownership and efficiency, from an operational perspective," he says. "The more important driver has become time to implementation: How quickly can you get the new application up; how quickly can you do business-to-business e-commerce with your constituents? Total cost of ownership takes a back seat to flexibility and adaptability. If you can implement small servers easily and quickly and save six months in time to implementation, it's worth it."

Buying Time

Wayne Kernochan, an analyst at Aberdeen Group Inc. in Boston, says he agrees.

"It's fair to say that using multiple small servers is a quick and dirty approach," he says. "With a new Web site application like e-mail or directories, you just slap in another server. ... When you're in a tearing hurry to get started and the long-term future doesn't matter, this approach makes a lot of sense."

However, David Friedlander, an analyst at Giga Information Group Inc. in Norwell, Mass., says that by scaling up instead of out, "you get a large quantity of processing power devoted to a single instance of an application. If you are running a stock exchange or processing thousands of financial transactions per second, then you need that more powerful processing engine."

"On a single large server, you don't need to consider the network as much because it's inside the box, and that makes administration simpler," adds Kernochan. "That's important, because our studies show that administrative costs tend to crowd out other costs in the long term."

But in the short term, it's the cost of purchasing, rather than maintaining, the server that matters most to e-commerce companies. Server prices vary, but Kernochan says an eight-processor machine can cost twice what you'd pay for a two-processor unit. The pricing equation doesn't shift in favor of the larger machine until you have scaled out beyond four processors or when your database grows too large, he says.

In theory, the Windows 2000 Datacenter Server operating system (due out shortly) should make it more feasible or more efficient to scale up rather than out, Richardson says. Datacenter allows a user to start with a small server and keep adding processors to the box, up to the limit of 32 processors. But scaling up this way will probably cost more than scaling out with small servers. And it's unclear how effectively the new Datacenter can partition a multiprocessor server and manage its workloads, Richardson says.

In light of the continuing rapid growth of e-commerce, it's likely that each strategy — scaling up and scaling out — will continue to have its place.

Alexander is a freelance writer in Edina, Minn.

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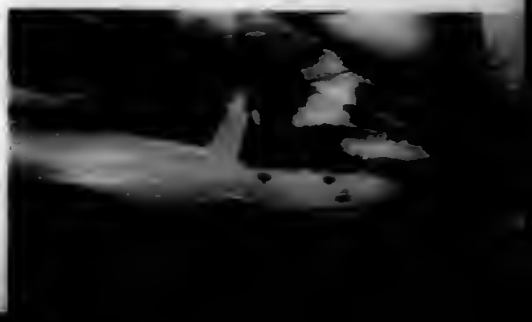

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Zoomin' Ahead

A zooming user interface could provide a whole new way to navigate through desktop directories – no more clicking through level after level of hierarchical data directories or scrolling through elusive pull-down menus. Your mouse will soon rocket you around your desktop. By Sami Lais

GRAPHICAL USER interfaces (GUI) look slicker than ever, but users are still getting repetitive stress syndrome and eyestrain from clicking on tiny icons and arrows to delve through level after level of hierarchical menus or snatch at skittish pop-out menus.

"I hate that," says Benjamin B. Bederson, director of the Human Computer Interaction Laboratory (HCIL) at the University of Maryland in College Park. "And scrolling? Nobody likes scrolling."

Bederson has been working on an alternative — zooming user interfaces (ZUI) — since the early 1990s.

A conventional GUI presents icons and text in a hierarchical list format. To see a list of the contents in Subfolder A, you must first click on Folder A. Drill down three or four levels, and the initial lists are off the screen. To view Subfolder B, you must close folders and backtrack. Total clicks: 10.

With ZUIs, subfolders need not be buried from view. The entire folder structure, in miniature, is on-screen. As a mouse pointer rolls over a folder or subfolder, that part of the structure leaps to the fore in conventional-size type while the rest of the miniaturized file structure remains on-screen. To drill down three or four levels, move the mouse an inch or so. To get to Subfolder B, make another 1-inch mouse move. Total clicks: none.

"ZUIs are at their best when interacting with hierarchical data," Bederson says, because "they eliminate window management problems and offer a way of navigating through information intuitively."

For example, network management software is a good target for a ZUI, he says. "Networks are hierarchical, have more information than fits on the screen, are visual and require understanding of overview and detail," Bederson adds.

Exploring the Possibilities

The ZUI's potential for improving business software is virtually untapped, according to Juan-Pablo Hourcade, a graduate student on Bederson's research team.

"One scenario we've been exploring is in presentations," Hourcade says. "Everyone uses PowerPoint, so another graduate student, Lance Good, is developing CounterPoint as a PowerPoint plug-in."

Users create their slides in Microsoft PowerPoint and "then just click to bring them into the zooming space," Hourcade says. All the slides are oo the screeo at once; a user rolls the mouse to zoom in to one slide and rolls back for the overview.

"It means your presentation is no longer linear — you can choose which slides to sbow and in what order," he says. "You don't have to create new preseotations for each audience. Whenever we give a presentation using zooming, it gets a big response."

Bederson's team has also developed KidPad, a storytelling application for children that illustrates ZUI functionality.

A user begins a drawing and then uses the middle button of a three-button mouse to zoom in. He adds details or text on a new layer at the new scale, zooming and repeating for further layers and clicking to back out and view the composite image. A story can include dozens of such images and allows a viewer to zoom from one image or layer to another and back.

CounterPoint and KidPad were built on Jazz, Bederson's free Java software development tool kit, which is set for a July 4 release.

Bederson used C++ to build Pad++, Jazz's predecessor, with Jim Hollan, now a professor at the University of California at San Diego. Pad++ "was aimed more at prototyping than real applications," Bederson says. The open-source Jazz was "structured for good software engineering and larger systems building," he adds.

Ken Perlin, a professor at New York University, is credited with coming up with the original idea for ZUIs. "Zooming iso't new," Hourcade says. "But what hasn't been around is a tool kit that lets you easily do it for any application."

Jazz also features fish-eye menus. In a fish-eye menu view, all items in a list are at least nominally visible.

Bederson and George W. Furnas first developed fish-eye views at Bell Communications Research in College Park, Md., Hourcade says, "but nobody had thought of fish-eye menus" until Bederson dreamed up the idea.

"Not exactly in a dream," Bederson says, "but I did wake up at 6 a.m. one Saturday with the idea clearly in my head. I hadn't even been considering the idea earlier." He spent the rest of the day writing the first version of the code.

Each item in a 100-item list on an average screen would be in type about 4 pixels high, Bederson says. As the mouse pointer moves over a list, the dozen or so list entries centered under the pointer gradually grow to normal viewing size.

Studies at the HCIL have shown that users prefer fish-eye menus for browsing and are about equally divided between fish-eye and hierarchical menus for more goal-directed tasks.

Kid's Play

KidPad, created in the Jazz Java software development tool kit, is the successor to Pad++, which was written in C++. Draw a simple shape (Figure 1), and then click and hold down the middle mouse button to smoothly zoom in. After zooming in (Figure 2), draw a second shape and zoom in again. After zooming in (Figure 3), draw another shape and type some text, and then zoom out (Figure 4) to an overview of all three shapes and text. The same concept can be applied to creating organizational charts or business process diagrams that show underlying applications and network resources, for example.

ECOSOC 2000

United Nations Economic and Social Council

Information Technology for the World

The United Nations Economic and Social Council (ECOSOC) has launched a campaign to turn the "digital divide" into a digital dividend. At its meeting in New York from 5 to 7 July, corporate executives will share the floor with ambassadors, national ministers of information and heads of international agencies. The Council's recommendations will be sent to the UN Millennium Assembly, opening in September.

For more information, visit the "IT for the World" website at **www.un.org/esa/coordination/ecosoc/itforum**, *or contact Tim Wall at telephone: (212) 963-5851; e-mail: wallt@un.org.*

To find out about the UN's new programme for cooperation with the business community, visit the "Global Compact" website ot **www.unglobalcompact.org.**

Software Development Goes Global

Problems with geographically dispersed software development projects drove Bell Labs to develop new collaborative tools. By Gary H. Anthes

A MISUNDERSTANDING OVER A single keystroke sent a software developer from Swindon, England, where he wrote his code, to Nuremberg, Germany, where the tester worked.

"They kept telling us it didn't work according to the spec," says Frank Wales, a technical manager at Lucent Technologies Inc. in Swindon. "Eventually, we had to fly the developer to meet with the tester. He said, 'OK, show me what you are doing.' The test spec said to type a blank when you got to a certain point. It meant to hit the space key, but the tester was typing 'b-l-a-n-k.' "

Incidents like this are no small problem at Lucent, which has more than 1,000 people developing millions of lines of code for its Global System for Mobile Communications (GSM) project. Developers of the wireless communications software work in eight major locations, including the U.K., Germany, France, India and the U.S.

Competition, increasingly coming from overseas, is what's driving Lucent and other companies toward distributed software development. "A lot of the mobile standards are driven out of Europe, so it's very important for us to have a presence here and be viewed as part of the European Community," says Dan Owens, Lucent's director of development in Swindon.

The downside is that distributed development also introduces delays and other problems. So Lucent's Bell Laboratories in Naperville, Ill., is rolling out a suite of computer tools to aid collaboration among its far-flung development sites.

According to extensive studies performed by the Software Production Research unit at Bell Labs, problems that span two or more locations in multi-

Divide and Conquer

Multisite software development projects can get into trouble quickly if the project leader fails to split up the work in an optimal way, say researchers at Lucent's Bell Labs. Because communication across time zones and cultural borders is difficult, managers should divide the work to minimize the need for intersite communication. The following are examples of four logical ways researchers have identified for breaking up projects:

By expertise: Develop a specific type of software in the location where programmers have the most experience in that application area.

By product structure: Divide the work by hardware architecture so the software that runs on a given device is developed in one place.

By process step: Complete the design near the customer and perform the coding where the programmers work.

By customization: Develop the base software in the U.S. then customize it locally for each market.

Lucent's development work most closely resembles the product structure model, but it's really a hybrid of the four approaches. The company will evolve "toward a more logical way of splitting up the work," says Frank Wales, a technical manager at Lucent in Swindon, England.

"You want to structure the work so it's less interdependent and requires less communications," says Robert Kraut, a human-computer interaction expert at Carnegie Mellon University in Pittsburgh. "The modularity of software is designed to reduce the interdependence between not just pieces of code, but of the people developing it." – *Gary H. Anthes*

site projects occur no more often than problems within a single site. The trouble is that they take two to four times longer to resolve.

Bell Labs also found that developers who need information from other sites are on average blocked from progress on their highest-priority work for five days per month. "And we found that work that spans sites in any way takes about two and a half times as long as comparable work all at one site," says James D. Herbsleb, who led the productivity and collaboration studies.

Failure to Communicate

A variety of technological, organizational and cultural factors also can cause delays. For example, researchers found that software developers rely heavily on local, ad hoc communications of the kind that take place by the coffee machine, yet they and their managers are often unaware of the importance of these informal exchanges.

"Even in the Information Age, the amount you communicate with people declines rapidly with distance," says Robert Kraut, a professor of social psychology and human-computer interaction at Carnegie Mellon University in Pittsburgh.

Two people in adjacent offices communicate half as often as they would in the same office. If one of them moves around the corner to another corridor, the frequency of communication falls by half again. And if the two are located on different floors in the same building, it's cut in half yet again, he says.

Lucent is revamping its approach to distributed software development on two fronts. It is developing tools and methods to boost the quality of its intersite communications and it is finding new ways to split work across sites to reduce the need for such communications (see "Divide and Conquer," page 94).

Building Trust

Emotional trust — the feeling that one can speak freely to a person one has never met — is often lacking between sites, says Herbsleb.

Cultural differences sometimes compound that mistrust. For example, Wales says, developers around the world differ in their willingness to take on problems not explicitly assigned to them. "If there's a bug and I'm the developer in the U.K or U.S., I'm going to call whoever I need to call to solve it. But in other cultures, they are not comfortable phoning people they have never been introduced to."

Lucent discovered that it could build trust by having key people travel to other project sites early in a project. "If you go to meet with someone, you try to relate to them, you bond with them," Wales says. "You only need to do that once, then you can have many e-mails and phone conversations and you actually trust that person more."

New Collaborative Tools

Bell Labs found that the communication tools commonly used in multisite projects, such as videoconferencing, electronic bulletin boards and workflow products, don't directly address the core problems it found in its studies. Use of videoconferencing, for example, has to be planned in advance and doesn't support ad hoc communication. Also, it is often plagued by technical glitches such as low quality audio, poorly aimed cameras and low bandwidth.

As a result, Lucent decided to develop its own tools to address three broad objectives: to make it easier to find organizational information, to make it easier to know the availability of people and to ensure more effective intersite meetings, especially

The Collaborative Interactive Viewing Environment, a Web-based tool box, automatically generates the appropriate world clocks, calendar entries, contact information and other data for each participant.

spontaneous ones. The tools include the following:

- Rear View Mirror, a "presence-awareness and discussion tool." This is a chat room tool that displays images of all of the people in a group, highlighting those who are logged.
- CalendarBot, a Web-based scheduling tool. It shows the planned whereabouts of project personnel by day and by month.
- Expertise Browser, a browser that finds and displays relationships among people, organizations and the code they produce.
- Collaborative Interactive Viewing Environment (CIVE), a Web-based tool box that shows the local time at each site, holidays at each site, people in a given group and CalendarBots for those people. It also contains a directory of phone numbers and e-mail addresses for the group's members.

Expertise Browser and CIVE were developed in-house because no commercial alternatives existed, Herbsleb says. CalendarBot was homegrown because no calendar tool ran on both PCs and Unix machines. And Rear View Mirror combines the functions of instant messaging and bulletin board products in one application. It allows staff to communicate synchronously and to establish threaded discussions.

Bell Labs also avoided commercial products because it wanted to enhance the tools over time, and that requires access to source code, says Rebecca Grinter, one of the leaders of the studies. For example, Rear View Mirror is being extended to allow a user to establish a voice telephone connection to others logged in — wherever they may be.

Wales says he hopes to see these tools — and perhaps more — integrated into a "virtual office" with a single interface. CIVE, which is just being introduced within the GSM organization, is the first step in that direction, he says.

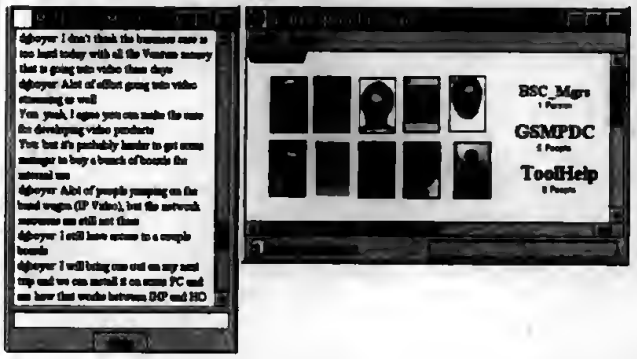
The Bottom Line

Use of the new tools so far has been mixed, with some of them used only sporadically, Herbsleb says. "But all of them have some enthusiastic users," he says. "By far the biggest issue is . . . critical mass. Even a small number of nonusers can kill it."

And the tools have to be developed and implemented with care, says Grinter. "Issues of reliability can kill the most enthusiastic of use," she says.

Now that Bell Labs has codified so much information about the GSM organization — about people, relationships, tasks, schedules and code — it would be a relatively small step to automatically "push" project information to people as events unfold and circumstances change.

But there is no rush to do that, Grinter says. "We risk jeopardizing our relationship with them by putting too much in their in-boxes." ◗



The Rear View Mirror collaboration tool offers instant messaging and a threaded discussion board for members of a development team. Users can click on a photo to establish a voice telephone connection.

Learning

Delivering training over the Web can be cost-effective and even profitable. But it can be hard to monitor, especially when users just dip into courses for a quick refresher. By Amy Helen Johnson

The 36,000 employees at Unisys Corp. have long been able to learn how to run a desktop productivity application more effectively, develop sales knowledge about the company's computer system products or acquire the skills needed to handle difficult co-workers. But starting in March, they no longer had to leave an out-of-the-office message on their voice mail and trek to a classroom; now they can take training courses while sitting comfortably at their own desks.

The change is the result of last year's debut of the Blue Bell, Pa.-based company's online university. By turning to Web-based training, also called e-learning, says Steve Trehern, acting vice president of Unisys University, Unisys has made more courses accessible to more people, been able to offer third-party and internally developed classes with more up-to-date product and technical knowledge, and created consistent training opportunities in all offices worldwide. Although it's too early to talk about return on investment, Trehern says, one indication that the program will be a success is that Unisys has seen these improvements while its training budget has remained flat from 1999 to 2000; he declined to name a figure, however.

This shift to training over the Web is a major trend within the corporate education market, says Daniel Rasmus, a vice president at Cambridge, Mass.-based Giga Information Group Inc. The established players in the market — corporate training specialists and universities — are developing e-learning capabilities, he says, while a oew type of vendor, the training portal, is emerging.

Training portals aggregate content from several instructional suppliers, compile a broad catalog of courses and wrap it all in a learning management tool that lets human resources departments track employees' progress. Even companies that have well-run in-house educational programs are expanding their curricula to include lessons delivered via the Web, Rasmus says. These come in the form of either internally developed courses or a contract with an outside training provider.

For the most part, these online efforts have a minimal impact on corporate information technology departments. In the case of portals and other external vendors, all that's required is a browser and audio capability on the student's computer. Adding Web-based delivery to an internal training system will require integration, Rasmus warns.

The firms *Computerworld* spoke with generally reported positive experiences with e-learning technology. Most are opting for outsourcing course development and server management or contracting with a portal, citing benefits similar to those Unisys reported.

But there are a few areas in which e-learning still needs to mature. Suppliers still operate under the assumption that people run through a course from start to finish, when in reality, students often just dip into a course to get specific information. Plus, learning management tools are proprietary, so it's difficult to track total usage when a company works with several different training firms or also offers traditional training. So, while corporate training managers and market analysts agree that e-learning is here to stay, they also warn that the industry is young and experiencing growing pains.

Expanded Options

E-learning comes in a variety of forms; recordings of live classes that are available for rebroadcast, self-paced courses and live, instructor-led classes are the most common. Video is usually absent because of bandwidth limitations and concerns about presentation quality, although streaming audio is a must. A

Making Web Training Work

THE E-LEARNING marketplace has a few lessons to learn as the technology matures. Here are some tips for getting the most out of Web-based training systems now:

- Curricula hosted by someone else will have the least impact on your infrastructure.
- Avoid any system that requires plug-ins or other special software; problem resolution will chew up IT support staff hours.
- Test the student's computer before he starts a class to make sure it can receive the course. Audio equipment and settings in particular may be trouble spots, especially if the student doesn't normally use audio in his job.
- You won't find a single learning management tool that works automatically with multiple e-learning vendors and application service providers or lets you extend its capabilities to track courses outside the e-learning environment (such as internal training courses). In the short run, you'll have to jerry-rig your own solution or work with multiple management systems.
- Calculating return on investment can be difficult, especially if you use e-learning on a need-to-know-it-now basis. Bolster the management tool's reports with surveys of your employees.

– Amy Helen Johnson

good live course will enhance lectures with interactive elements that take advantage of the Web, such as instant messaging, polls, the ability to exchange information among participants, application sharing and whiteboard features.

Web-based training is a popular option among companies because it's cheaper than classroom training — there are no travel costs, and employees don't miss as many work hours. Also, it's available around-the-clock worldwide, so students can take classes anytime, anywhere. Contracts with training portals can cost from $16 to $22 per student, although when companies add in the cost of lost productivity while a student takes a class, the costs can run to several hundred dollars per day.

In addition, Web-based teaching methods offer a way to disseminate information quickly throughout an organization — the distribution of new courses is close to immediate, in contrast with burning and shipping CD-ROMs.

Leading the e-learning market are a slew of new dot-com companies that operate as application service providers. They aggregate classes from third-party vendors or design content themselves and combine the courses with a learning management tool for tracking cost and employee participation. By turning over the tasks of hosting the courses and keeping the lessons current, companies see a minimal impact on their technology infrastructures and human resources departments. Other companies have built shrink-wrapped tools for creating courses, while some of the big names in computing, such as IBM and Microsoft Corp., have e-learning initiatives flush with standards, tools and technologies.

Jim Ayube, a senior analyst at Aberdeen Group Inc. in Boston, estimates that the e-learning market had about $500 million in sales last year, and he's forecasting growth into the $10 billion to $12 billion range in 2002. But e-learning isn't replacing the traditional set of training tools; rather, it's supplementing them.

At Genzyme Inc., a medical research firm in Boston, Rick Bellingham, vice president of organizational learning, is aiming for a 50/50 split between classroom and online training. He chose TrainingNet Inc. in Billerica, Mass., because it offers a mix of online, book-based, self-paced and classroom courses that give his employees options, so they can choose how they want to learn.

However, some courses are just better in a classroom, Bellingham says. For example, an in-house course on leadership skills for individual team

Open Market: Train to Retain

ED MALITSKY

MIKE MESSIER, Open Market's vice president of human resources, turned to Web-based training to attract and retain employees in today's tight labor market

OPEN MARKET INC., a 6-year-old software company in Burlington, Mass., has had trouble finding and keeping good employees. That's no surprise to anyone who has tried to hire programmers in the current hot job market.

Like many companies, Open Market is looking for ways to attract and retain skilled technical people. One perk it has put into place, says Mike Messier, vice president of human resources, is a comprehensive Web-based training program.

The company's previous education efforts took the form of "by chance and by accident," says Messier. That wasn't good enough to compete for talent against older, more established companies with sophisticated training systems, he says. Anecdotal evidence pointed toward growth opportunities as a key way candidates differentiate prospective employers. Messier validated that theory by doing some internal research with current employees and then signed up for an e-learning service from TrainingNet Inc. in Billerica, Mass.

TrainingNet aggregates courses from many different vendors, delivering both online and live classes. Messier says he likes the ability to offer a broad set of classes without human resources taking on a lot of overhead, which would have happened if his department had to manage relationships with multiple course providers. Another big draw is TrainingNet's geographical reach, says Messier, because Open Market has international employees it needs to include in the program.

Open Market's training center opened in January as an intranet application that acts as a gateway to TrainingNet's catalog of technical, managerial and personal development courses. Any employee can take any course, with his manager's approval, says Messier.

In order to give the program the best chance of success, he says, Open Market did two things. First, all managers took a course on career and skills development so they could coach employees on how to get the most out of training. Second, Messier ran a contest to promote the new program: everyone who signed up was entered into a drawing for a digital camcorder.

So far, about 5% of the company's 600 employees have taken a course, according to Messier. He says he thinks the program is working well, because employees say they feel the company is investing in their success. Messier is gathering data to measure return on investment, looking to validate his investment in terms of productivity increases, a drop in employee turnover and a rise in skill levels. – *Amy Helen Johnson*

gbyWire

members needs face-to-face interaction in order to work. But technology and regulatory or compliance classes, such as those about sexual harassment or equal opportunity employment laws, work well over the Web.

What's not working for Bellingham are the learning management modules he wants to use to determine his return on investment. So far, he hasn't put such a system into place because he hasn't found one that meets all his requirements, he says.

Bellingham says he would like to have a universal registration tool for all training vendors that includes usage tracking, report generation, skills assessment and a way to analyze his company's investment. Plus, Genzyme has a special need for Food and Drug Administration validation to prove that its employees are meeting certain government standards.

Genzyme budgets about $6 million per year on employee training, and it's important for the company to know whether it's getting value out of that investment. "The problem with most organizations is that they spend a lot of money and they don't know where they're spending it, how much they're spending or what they get in return," Bellingham says.

Ken Estabrook, supervisor of training and development at the Applied Physics Laboratory at Johns Hopkins University in Baltimore, says he shares Bellingham's frustration about the management piece of the puzzle. In his view, management tools not only need to be flexible enough to handle multiple training suppliers; they need to reflect the way people use the products.

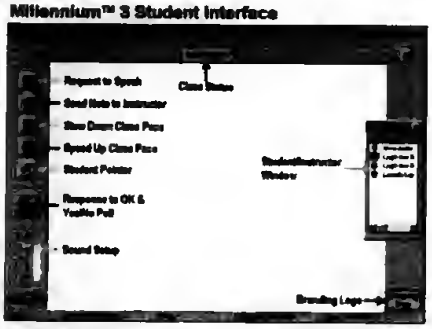
Estabrook deals with three training vendors: SmartForce Inc. in Redwood City, Calif.; KnowledgeNet Inc. in Scottsdale, Ariz.; and KnowledgePlanet.com Inc. in Reston, Va. Because their learning management systems don't communicate, he's dealing with multiple systems, which makes gathering information about a student's progress difficult, Estabrook says.

In addition, the management systems reside on the vendors' servers; he says he would like to put a learning management tool on his own desktop, where the management tools could better serve students as well. Estabrook says he wants students to have a registration utility that can handle input from multiple vendors, so they can go to one source to find a class, instead of having to search three different course catalogs. "I want it to be seamless," he explains.

In addition, during the past three years, Estabrook has learned a lot about how his 3,000 employees — technical staff, managers and administrative support staff — use online training. They dip into a course for information when they need it, he says. For example, a person might run through an Excel training module once but thereafter access it for specific lessons, such as a refresher on pivot tables.

So Estabrook says he also wants the vendors to build management tools that measure access, not just completed courses. Of the 6,000 times employees accessed courses during the first year of operation, many were to retrieve specific information. Those instances showed up as uncompleted courses, Estabrook explains, because the employees didn't run through entire lessons and take the final tests. Because there weren't a lot of completed courses, even

Millennium™ 3 Student Interface



INTERWISE'S TOOLS feature special controls that allow students to interact with an instructor and work with materials at their own pace

though employees spent a lot of time using the training system, there wasn't a lot to show for it, according to the tool's canned analysis. The result was a skewed cost per course, Estabrook says.

Estabrook ended up looking at the time spent in the system and the number of accesses and then asking his employees about the system's effectiveness. That survey found that they were happy; they got the information they needed and got on with their jobs. So using a rough measure of price divided by the number of accesses, Estabrook estimates that it cost about $12 to get someone that just-in-time piece of information he or she was searching for. "The value is getting people back on the job with the right information," he says.

Next Semester

Rasmus says vendors are starting to address the problems with e-learning software — and with the management modules in particular. They're under pressure from corporations that are bringing in Web-based training and demanding a high level of maturity from the products. Those efforts will be helped by the natural consolidation that's occurring among the vendors, he says. Consolidation will lead to integration among the product offerings, and high-level initiatives — such as IBM's Mindspan Solutions e-learning business unit — with the ability to impose de facto standards on the marketplace will further those compatibility efforts.

Clark Aldrich, a research director at Stamford, Conn.-based Gartner Group Inc., predicts that companies will find new ways to use e-learning tools. One big area is customer education (see story at left). It can also be used to quickly disseminate information throughout an organization. Transferring knowledge, processes and culture is a job that can't be outsourced, Aldrich says — you have to do it yourself, and you have to do it quickly. E-learning can be a good tool because you can develop content quickly and present it to everyone in a short period of time, he explains.

Aldrich says he also expects new teaching methods, such as role-playing simulations, and more user-friendly features, such as the just-in-time access that Estabrook wants, to transform e-learning.

"Right now, we're replicating the classroom experience online," he says. "Eventually, e-learning will be integrated into the everyday knowledge acquisition process during the workday." ◗

Johnson is a Computerworld contributing writer in Seattle. She can be reached at amyhelen@pobox.com.

Vendor U.

CONSIDERING THAT technical courses represent the largest category in the Web-based training market, it's no surprise that high-tech vendors are turning to e-learning as a channel for their own product training offerings. What's interesting is that it's becoming a revenue stream, not just a customer service cost.

At SAP America Inc. in Newtown Square, Pa., the idea to go online first germinated about three years ago, says Ronald Berman, director of education for business development. At that time, the company noticed that customers were resisting the travel and out-of-office expenses attached to classroom training.

After choosing the e-learning model, SAP added Web-based classes – live, recorded and self-paced – to its classroom, certification and book/CD training options. The e-learning classes are aimed at experienced SAP R/3 end users and concentrate on providing upgrade information about how to use new features. These are low-cost, quick-hit classes – $200 for two hours – that provide SAP with a new revenue stream.

Because accelerated product cycles have shrunk the useful life of the information he's selling from 18 to four months, the Web is a better medium than CDs and classrooms to disseminate this fast-changing training, Berman says. Updating a Web-based course is easier and more cost-effective than burning and distributing a new round of CDs. Furthermore, a Web-based course can reach more of his customers in a shorter amount of time than a classroom-based one can, he says.

Along with fast development time, lower costs are a key component of Berman's business model. He uses courseware tools from Interwise Inc., a Tel Aviv-based company with U.S. headquarters in Santa Clara, Calif., that translates PowerPoint slides into lessons enhanced with audio.

PowerPoint is a good starting point for SAP's instructional developers, Berman says, because they're familiar with the application. Also, the PowerPoint format makes it easier to get internal experts to contribute content. The translation by Interwise is straightforward and results in a fast development cycle – it takes only 40 hours to develop one hour of Web-based lesson content, according to Berman's calculations.

> We've tripped onto something that's rather outstanding. Customers are buying it, and they're happy.
>
> **RONALD BERMAN, DIRECTOR OF EDUCATION FOR BUSINESS DEVELOPMENT, SAP AMERICA INC.**

Since the live courses became available last September, about 700 people have registered for them, Berman says. He says he's really pleased to see that about 50% of the companies represented have returned for another course, and 20,000 people have downloaded the recorded sessions. "We've tripped onto something that's rather outstanding," he says. "Customers are buying it, and they're happy." – *Amy Helen Johnson*

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Taking the Bite Out of Online Presentations

Start-up Brainshark lets users organize and publish multimedia presentations

BY STEVE ULFELDER

STEVEN FEINSTEIN is the director of internal training at Progress Software Corp., a Bedford, Mass., company that has about 1,300 employees in 100 countries and needs to deliver consistent training worldwide. "I can't send my subject matter experts all over the place," Feinstein says. "The Australians especially want to hear [about new products] straight from the developer. To them, it's like talking to God."

Feinstein turned to Brainshark Inc., a start-up in Waltham, Mass., that wants to help information technology departments excuse themselves from the process of creating and tracking multimedia presentations. The idea is to let content experts upload Microsoft PowerPoint presentations to Brainshark's servers and then — using a simple telephone interface — create their own voice-over.

Brainshark automatically tracks topics, authors and keywords for searches. The service has worked well enough for Progress that Feinstein plans to do all internal training with Brainshark.

The service's real value may be as a knowledge management tool. Users can easily update a presentation for a point release, for example. And over time, a business can build a database of presentations created by experts. That expert knowledge often slips away as personnel turns over and products evolve.

"It's astonishing that this space has been overlooked" until now, says Art Williams, a director at Boston-based Giga Information Group Inc.

The Root Problem

Joseph Gustafson, Brainshark's founder and CEO, sold his first business — a training company called Relational Courseware — to Stamford, Conn.-based Gartner Group Inc. in 1996. "We came up with some great content," Gustafson says, "but building that content would take 75 days and $50,000 per e-learning course. You couldn't change the content easily, and you couldn't easily make it available in foreign languages."

He says Gartner clients told him, "You're only hitting 5% of our needs. We've got so many proprietary applications and projects, how are we going to get that information out?" The result was Brainshark, a start-up in which Fort Myers, Fla.-based Gartner affiliate SI Venture Management LLC is an investor.

Brainshark authoring couldn't be much easier: A user creates a PowerPoint presentation, uploads it to Brainshark, fills in some indexing information and picks up the telephone to create the voice-over. Attachments, such as white papers and Excel spreadsheets, are easy to append using a menu-driven interface. Once the presentation is complete, the user e-mails a link to recipients.

Experience Inc., a Boston-based software firm that helps automate online college recruiting, needs to train the university career centers that buy its products.

"There's so much functionality, and we've only got six hours on-site," says Marybeth Hickey, a client services consultant at Experience. She uses Brainshark to create a pretraining tutorial that teaches users the basics, "so we can start [the on-site training] at a higher level. It lets us focus on consulting," she says. "The product has worked really well."

Competitive Forces

Brainshark faces some challenges: It's tough to sort out the raft of small players in the collaborative service and support technology field, and there's an ever-present threat that a big fish will simply absorb the niche as an afterthought. Brainshark needs to establish a big footprint before its window of opportunity closes.

Improvements are in the offing. Brainshark is working to let users upload Microsoft Word documents in addition to PowerPoint presentations. The company had better hurry; Feinstein and Williams say they agree on that point. "Word would be cool," Feinstein says wistfully. A little experimentation with Brainshark exposes another weakness: the unpredictable audio quality of telephones. Even the demonstration at Brainshark's Web site sounds like a transmission from citizens band radio.

Interestingly, Brainshark's other hurdle may come from the very strength and simplicity of the idea, which "makes complete sense," Williams says. "This is not a complex product," he says. "All they have is the first-mover edge — a few months' head start."

The question Brainshark faces is, Will that be enough?

Ulfelder (sulfelder@charter.net) is a freelance writer in Southboro, Mass.

SCOTT PUBRIN

BRAINSHARK CEO JOE GUSTAFSON says he first saw the need for online presentation management at Gartner Group

Brainshark Inc.

Location: 411 Waverley Oaks Road, Suite 333 Waltham, Mass. 02452

Telephone: (781) 647-4900

Web: *www.brainshark.com*

The technology: Brainshark's service lets content experts easily create, distribute and organize multimedia presentations. The goal of such services is to efficiently manage Web-based communication, interaction and content.

Why it's worth watching: The system is extremely easy to use. Its index and search features make it a good repository for corporate knowledge.

Company officers:
- Joe Gustafson, CEO and co-founder
- Mark Yacavone, vice president of product management and co-founder
- Chris Paul, vice president of engineering

Milestones:
- Fall 1999: Company founded
- May 2000: First product ships

Employees: 30; projected 65% annual growth

Burn money: $4.2 million from One Liberty Ventures, SI Venture Management LLC (an affiliate of Gartner Group Inc.), Reach Internet Incubator LLP, Citizens Capital Corp.

Red flags for IT:
- Telephone audio quality limits the usefulness of the voice annotation feature.
- Low barriers to entry and lack of significant technology differentiators could affect Brainshark's long-term prospects.
- While there is little direct competition to Brainshark right now, larger, more established companies could expand into this growing market.

COMPUTERWORLD emerging companies

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The Big Picture

According to Framingham, Mass.-based International Data Corp. (IDC), Brainshark's niche, collaborative service and support technology (CSST), is an $11 billion market that will grow to $43 billion by 2003. Christopher J. Hoffman, an IDC analyst, says he expects "consolidation or, rather, convergence around functionality" in the CSST market. The company's offerings overlap with those of several other players, including these:

Centra Software Inc.

Lexington, Mass.
www.centra.com

Centra's software and services let businesses conduct live meetings, training sessions and presentations on the Web. It offers a wider range of products and services than Brainshark.

Digital Lava Inc.

Marina Del Rey, Calif.
www.digitallava.com

Digital Lava's new HotFoot software and service competes directly with Brainshark and offers more features – but a more complex interface.

PlaceWare Inc.

Mountain View, Calif
www.placeware.com

This service lets users upload and broadcast live PowerPoint presentations. Users access the presentation by visiting the Web site. PlaceWare focuses on meetings, while Brainshark's big appeal is in training and one-to-many uses.

Presenter.com Inc.

San Jose
www.presenter.com

Presenter.com uses the application service provider model and offers streaming audio, which means higher quality. Presenter.com also rents out existing presentations, so you can check out, for instance, a panel discussion on business-to-business models.

WebEx Inc.

San Jose
www.webex.com

Specializes in real-time, multimedia Internet conferencing services. One slick feature: One participant can run an application while the others watch on their browsers. – *Steve Ulfelder*

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Paying the New Online Pros

In today's tight job market, it's tough to bag the talent without breaking the bank. Determining a suitable but attractive salary is even more difficult in the e-commerce space, where jobs may be new and have no traditional pay scales attached to them. By Mary Brandel

When it comes to paying critical online and e-commerce professionals, how do you find the best salary benchmarks? So that you're not flying blind, *Computerworld* asked a few hiring managers and recruiters how they determine fair pay. Here's what they said.

BUSINESS ARCHITECTS

Garden.com Inc.
Web-based garden resource business
Austin, Texas

■ **Job opportunities:** Garden.com is seeking "business architects" or programmers who are as comfortable with technology as they are with business. "When I say 'business architect,' people say, 'Don't you mean business analyst?' " says David Zahn, manager of enterprise development. "But we changed the title because these are people who come from the consulting world — coders who spent more time on the business side doing implementation or even got their MBA and understand things like permission marketing."

■ **Experience/skills sought:** Zahn says he hopes to find people with both business and technical skills; perhaps they went to business school and focused on technology. Consulting backgrounds also work well.

■ **Recruiting experience:** "Seemingly all I do is recruit these days," Zahn says. "Mooths can go by where you don't see anyone with the right skill set." The company is doing lots of recruiting oo technical Web sites and its own site and has visited numerous colleges.

■ **Salaries and benefits:** Because of the company's Austin location, it's especially sensitive to staying competitive. The compensation package includes stock options and discounts on services such as massages, car detailing, oil changes and dog grooming.

■ **How salaries and benefits are determined:** You won't find the title "business architect" on a traditional salary survey, although Zahn is starting to see it crop up at other companies. So Garden.com looks to the salary demands of business school graduates and consulting firm émigrés. "We consider a lot of variables," Zahn says. Each compensation package is tailored to the individual being hired.

E-COMMERCE PROS

Pencom Systems Inc.
Technical recruiting firm
New York

■ **Experience/skills sought:** Pencom is finding that the most common e-commerce openings are for Oracle database administrators and Java developers, architects and senior engineers, according to Ben Sabrin, senior Java search consultant at the company's Atlanta office. Sabrin is also seeing fewer nontraditional, wear-many-hats types of e-commerce jobs. "Things have gotten more structured," he says. "There aren't so many jobs now that are undefined."

■ **Recruiting experience:** It's still very hard to find good people, according to Sabrin. Pencom posts ads on online job boards but mainly relies on direct sourcing.

■ **How salaries and benefits are determined:** In general, there are no strict pay scales for any e-commerce job, even traditional programming positions, Sabrin says. "Companies have an idea of what they want to pay, but if it comes down to paying $1,000 more to get the right person, that won't break the deal," he says.

WEB DEVELOPERS

Toysmart.com Inc.
(Closed last month)
Web-based toy business
Woltham, Mass.

■ **Job opportunities:** Until its recent closing, the high-profile online toy retailer was recruiting for senior Web developers, architects, database administrators, report writers and quality assurance people.

■ **Experience/skills sought:** "We started out by looking for people who could do everything — look-and-feel, the back end, operational stuff," says Mark Stearns, former director of Internet production. "But in the last few years, the skills have started to become more specialized. The developers are focusing on development, the front-end guys are doing look-and-feel."

■ **Recruiting experience:** Toysmart used an internal recruiter who monitored job Web sites, placed newspaper ads and went to job fairs.

■ **Salaries and benefits:** Toysmart's policy was to match salaries and add stock options, although there were exceptional cases when higher offers were made.

NET ASSETS

RightNow Technologies Inc.
Internet customer service company
Bozeman, Mont.

■ **Experience/skills sought:** RightNow is looking for professionals with Java, JavaScript and traditional C skills. "The people I'm looking for are really good computer scientists with experience in the Web," says Michael Myer, vice president of product development.

■ **Recruiting experience:** "It's hard to find the right people," Myer says. At the same time, RightNow's location in Montana is a real plus for those who are tired of urban living.

■ **Salaries and benefits:** Entry-level people start in the $40,000-to-$50,000 range. People with one to four years of experience get $50,000 to the mid-$60,000s. The higher range is $60,000 and up.

■ **How salaries and benefits are determined:** Myer keeps salary surveys, but he uses them only as guides because they don't pertain directly to the Internet or to Bozeman, he says. "We gauge the willingness of people to accept what we offer," Myer says. ▶

Brandel is a freelance writer in Newton, Mass.

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Communications Engineer 0077 Successful candidate should possess a BSEE and 2 years experience in analog and digital board design. The ideal candidate would have work experience and coursework in communication theory and recent experience in either QPSK or QAM demodulator design. Experience in RF design is desired. Basic understanding of C programming is required. Must work well within a team to achieve the critical goals. Candidate should be skilled in problem solving, both on a hands-on and analytical basis.

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SOFTWARE ENGINEER to design and develop software for commercial real estate industry applications using Excel, Visual Basic, Visual Basic Script, Access, SQL Server, ARGUS, Project, and DynaLease under Windows operating systems. Design, develop, test, implement, maintain, and integrate Web-based Multi-Housing Acquisition/Disposition Management System, Multi-Housing Underwriting Database, and a Lease Rollover Analysis Database; Design and develop customized import routines for financial information such as revenue and expense accounts, rent roll information from different accounting systems such as AMSI, Rent Roll, Skyline, Timberline, and JD Edwards into the Multi-Housing Underwriting model using ODBC connectivity; Administer customized contact and information management system (Rubicon); Develop custom import and export routines from Rubicon to the Underwriting and Lease Rollover Databases; Perform detailed financial analysis on various acquisition/disposition projects; Perform discounted cash flow analysis using ARGUS, Project, and DynaLease Require M S degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered or as a Programmer/Analyst. Salary $68,000 per year 8 30 am to 5 30 pm, M-F Send resume to Thomas Malcolm Mccomb III, Senior Vice President, CB Richard Ellis, Inc. 100 Galleria Pkwy, Suite 500, Atlanta, GA 30339 Attn Job AC

PeopleSoft Technical Consultant. Duties Design, develop & implement software solutions for PeopleSoft ERP Resp for Fit and Gap analysis, indentifying data transfer requirements & modifying PeopleSoft legacy system Perform application design, set-up & testing using PeopleSoft. Perform troubleshooting of system & provide post-production support. Requires. M S. (or foreign equiv) in Comp. or Info. Sci , Eng. or related field and 1 yr. exp. in the job offered or 1 yr exp. as a Consultant or Software Eng. Exp. which may have been obtained concurrently, must incl. 1 yr exp. designing, developing & implementing software solutions for PeopleSoft ERP & 1 yr. exp. using PeopleSoft. EOE. 40 hrs./wk., 8:00 a.m. to 5 00 p.m., Salary: $70,000/yr Send resume (no calls) to: Diana Tuccito, AnswerThink Consulting Group, 817 W Peachtree St., Suite 800 Atlanta GA 30308 Must have legal auth to work in U S.

INFORMATION SYSTEMS ENGINEERING SPECIALIST'S

The New Mexico General Services Department, Information Systems Division in Santa Fe is currently accepting applications for an Information Systems Engineering Specialist 4 and an Information Systems Engineering Specialist Supervisor The positions will be responsible for planning, installation, testing and coordination of mainframe software products in an MVS operating system. The supervisor position will also be involved in personnel related activities The work will be performed primarily in an office setting with possible travel, night or weekend work and some high levels of stress during times of system installations or service outage s.

APPLICANTS MUST POSSESS:

- High School Diploma or GED.
- ISES4 - 10 years experience in advanced/specialized complex technical work on a mainframe computer at a centralized information systems facility, with responsibility for support of 40 or more integrated application-independent licensed software products operating under a VM or MVS operating system (college education in computer science may substitute year for year for the non-supervisory experience)
- ISESS - 10 years of which 5 years were in supervision of technical work in support of a VM or MVS operating system, operating on a mainframe computer at a centralized information systems facility, with responsibility for support of 40 or more integrated application-independent licensed software products operating under one or more of the above operating systems (college education in computer science may substitute year for year for the non-supervisory experience).

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ISESS - Pay Grade 35 ($24.116 - $36.174/Hour)

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Interested individuals must submit the SPB 500 Application and/or the Official Statement of Job Interest Form (SPB 600) to the State Personnel Office and the General Services Departments Human Resources Bureau no later than July 7, 2000, close of business. For further information see the the State Personnel Office web page at www.state.nm us/spo/recruit htm or contact Art Aranda, GSD Human Resources Bureau at (505) 827-2062

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If you are at all interested in our company, please mail, fax or email your resume to Human Resource Department, Intellisys Technology Inc., 801 N Cass Avenue Westmont IL 60559, fax. (630) 455-1333; email recruit@7hillsys.com.

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Respond with resume only to Ms. Natalie Perry, Manager HR, Global Resource Mgt., Polaroid Corp., 920 Winter St., (R1 1), Waltham MA 02451 Fax (781) 386-9540. Email perryn@polaroid.com.

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Oregon
- Sr Technical Consultant, Oracle Applications Developer

Virginia
- Knowledge Team Coordinator Assistant
- Sr. Consultant / Architectural Specialist
- Staff Consultant (Applications Builder/Programmer)

Travel may be required Salary DOE Send ad & resume to Adr 31281-7, Attn: Patty McNally, 2100 East Grand Ave El Segundo, CA 90245 **Please indicate specific title/location of job for which you are applying on your application letter.**

(i) Structures Inc. is seeking qualified individuals for employment in the following positions at these locations:

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- Computer Analyst/Sr. Analyst
- Applications Development Project Manager

Omaha Nebraska
- Computer Analyst/Sr. Analyst
- Database Administrator
- Applications Development Project Manager
- Transition Manager
- Help Desk Coordinator

Denver Colorado:
- Senior Computer Programmer

Phoenix Arizona
- Computer Analyst/Sr. Analyst
- Open Systems Supervisor
- NT Architecture and Operations Administrator
- Microsoft Applications Developer

Waltham Mass.
- Database Administrator
- Oracle Application Developer
- Microsoft Applications Developer

Computer Programmer/Sr. Programmer: Will write computer code to meet the specific needs of our customers using one or more of the following: COBOL, CICS, JCL, and DB2, in a IBM MVS mainframe environment.

Computer Analyst/Sr. Analyst: Will do one or more of the following, design, analyze, study, review and computer code to meet the specific needs of our customers using one or more of the following, COBOL, CICS, JCL, IMS, and DB2, in a IBM MVS mainframe environment.

Database Administrator: Will perform backup, recovery and tuning of Oracle or ADABAS databases as well as system configuration and disk storage management. Will create initial software installations, resolving database errors and failures, managing system access, auditing activities and resource utilization, and generating database objects using ADABAS in a mainframe environment; or Oracle 7.X, & X, or IMS in a mainframe, UNIX or NT environment.

Applications Development Project Manager: Will manage, supervise and coordinates activities of (1) computer programmers who write computer code to meet the specific needs of our customers using one or more of the following: COBOL, CICS, JCL, and DB2, in a IBM MVS mainframe environment, and (2) computer analysts who design, analyze, study, review and computer code to meet the specific needs of our customers using one or more of the following, COBOL, CICS, JCL, IMS and DB2, in a IBM MVS mainframe environment.

Transition Manager: Will supervise transition analysts who create cost/benefit analysis, assist in migration of customers systems, and assist in the preparation and maintenance of project plans, provide business analysis for the development and maintenance of low complexity systems/specifications in an IBM AS400 environment, an IBM MVS mainframe environment and an open system (UNIX) environment. Will use knowledge of AS400 mainframe and open systems hardware maintenance contracts, and software and hardware change processes to implement project plans.

Help Desk Coordinator: Will assist with the creation and evaluation of Help Desk tools and procedures for use by support staff and management for use in various systems including an IBM MVS mainframe environment using experience with HEAT and Infoman software, and using the following systems and their supporting software: OS/390 systems, UNIX (HP/AIX and/or Sun Solaris), Windows NT, and AS/400. Will also critique help desk personal implementing these tools and procedures. Must be willing to carry a pager and respond to pages 24x7x365 as required by business, and to travel on shot notice.

Open Systems Supervisor: Will supervise and coordinate activities of system administrators who configure computers to meet the specific needs of our customers using one or more of the following tools: V1, BMC IMS, scripting and Oracle in a UNIX and NT environment. Will also supervise and coordinate storage administrators who design, analyze, study, review and customize disk volumes and backup strategies off our customers using one or more of the following: Veritas, TSM, TimeFinder and BCVs in a UNIX and NT environment.

NT Architecture and Operations Administrator: Will develop, oversee, and implement customer's use NT servers core functions, including Operating System, File & Print functions, Logon scripts, and Back Office programs using experience in following NT services: Backup & Restoration, Anti Virus, Exchange, UserID Management. Application Support of NT Applications running on NT servers. Will prepare internal training materials and assist in training of employees. Will provide ad hoc desktop support as needed.

Oracle Application Developer: Will use Oracles PL/SQL and Designer/Developer 2000 Suite, and Java to plan, develop, and implement of client applications, and assisting in the preparation of project work plans, including the determination of the project time lines, resource requirements, critical design review points, and deliverables to the customer. The successful candidate will possess strong technical and communications skills, be a team player, understand their role in the development of applications, and take responsibility for their own actions and work effort. Experience with other RDBMS, Client server tools and the web a plus.

Microsoft Applications Developer: Responsible for the planning, development, and implementation of client applications, assisting in the preparation of project work plans, including the determination of the project time lines, resource requirements, critical design review points, and deliverables to the customer. The successful candidate will possess strong technical and communications skills, be a team player, understand their role in the development of applications, and take responsibility for their own actions and work effort. At least two years development experience with Visual Basic, Visual C++, Microsoft Exchange, SQL Server, and Internet/Intranet deployments is a must. Enterprise-wide application of the entire suite of Microsoft products is a definite plus.

Please send resume via email to: i-structure.hr@i-structure.com, or by letter to: Amy Ostrand, 13710 FNB Parkway, Suite 400, Omaha, NE 68154.

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Chief Computer Programmer /COBOL. Plan, schedule, direct and coordinate activities of computer programmers. Responsible for creation and maintenance of computer software and supporting documentation. Requires a master's in Computer Science and 3 years experience, including 2 years experience in COBOL. 40 hours per week. Send your resume to Mgr Employment Relations, BlueCross BlueShield of Tennessee, 801 Pine Street, Chattanooga, TN 37402. Refer to Job Code CCPC-01.

Project Manager: Supervise & direct the full life cycle development of customized multi-tiered client/server based applications using PowerBuilder, Sybase & object oriented technologies including C++ & UNIX. Must with clients to discuss their business needs, determine user specifications/requirements & recommend customized software solutions &/or appropriate information technology enhancements/modifications to existing systems. Conduct regression testing using automated application testing tools including SQA Team Test to ensure that new or enhanced software solutions are compatible with existing information systems. Responsible for all areas of project management including task allocation, scheduling & supervision in the areas of design, coding, testing, review, quality assurance, system integration, implementation & maintenance. Supervise 7-10 software engineering professionals, programmer/analysts, application technical specialists & SQA specialists. Must have a Master's degree in Computer Science, Engineering or Physics. Must have at least two years of experience in the job offered or as a Senior Software Engineer. Experience as a Senior Software Engineer must include: 1) Full life-cycle development of customized multi-tiered client/server based applications using PowerBuilder, Sybase & object oriented technologies including C++ & UNIX; and 2) Regression testing using automated application testing tools including SQA Team Test. 40 hours/week, 8:30am - 5:30pm, Monday-Friday. Overtime required as needed. $72,500/year. Overtime pay exempt. Must have proof of legal authority to work permanently in the U.S. Submit resume to: Bureau of Workforce Program Support, P.O. Box 10669, Tallahassee, FL 32302-0669. Job order: FL-2088419

Programmer Analyst - PC Networking/Sys. Admin. & Appl. Integration: Utilizing know. of networking topologies, networking technologies & PC architecture install, configure & manage physically distributed computer networks & network operating systems. Provide user support, network troubleshooting, network expansion, printer services & back-up mgmt. Coordinate local &remote hardware & software configuration; implement & execute operations procedures & monitor system resource utilization; perform capacity planning. Interface main application environ. w/ underlying networking software. Carry out performance tuning of network for user applications. Req: B.S. in Comp. Sci. - Math/Engr'g/Sci./Business-Commerce or equiv. 1 yr. exp. in job offered or as a Programmer Analyst/Systems Analyst. Must have appropriate combination of skills as follows: 2 of A & 2 of B & 1 of D; or 2 of A & 2 of B & 1 of C & 1 of D. A includes Operating Systems: Novell NetWare, Windows NT, OS/2, Windows 95. LAN Server. Banyan Vines, LANmanager, LANtastic; B includes networking: IPX/SPX, TCP/IP, FTP, Windows for Workgroups, NetBIOS, X.25; C includes Network Mgmt.: SNMP, LANanalyser, NetView, NetManager; D includes LAN technologies: Ethernet, Token Ring, FDDI. High mobility preferred. (Multiple positions). 40 hrs/wk. $53,000 - $66,000/yr. Report/submit resume to Terry N. Faust, Mgr., Washington County Team PA CareerLink, Millcraft Center, Ste. 150LL, 00 West Chestnut St., Washington, PA 15301. Web 105457

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Compensation and benefits packages with Saudi Aramco are quite competitive. In addition to base salaries comparable to those in the U.S., expatriates benefit from premiums and tax advantages. In addition to the generous travel allowances and vacation packages, a long line of benefits includes group insurance, an outstanding medical plan, retirement income, a savings plan, short- and long-term disability plan and a repatriation allowance. For consideration, please send a resume/salary history to: **Aramco Services Company, Dept. 068-COMPWORLD,** in one of the following ways: **E-mail: resumes@aramco.com** (please cut and paste rather than send an attachment); **Fax: (713) 432-4600; Mail: P.O. Box 4530, Houston, TX 77210-4530.** To find out more, visit **www.aramcoservices.com** under Opportunities at Saudi Aramco, Computer/Communication, EDP Systems Analyst/F17-108245, F17-108347, F17-108451, F17-108594 & F17-108754.

BUSINESS SOFTWARE ANALYST

Business Software Analyst to study, review and analyze business processes to determine feasibility of implementation of PeopleSoft Enterprise Resource Planning computer software. Confer with personnel of all functional business units to analyze current operating procedures and prepare business processes for all functions of business operations including financial management, accounts payable, accounts receivable, inventory, order entry, payroll, benefits, etc. Conduct fit gap analyses to determine if existing business operations can be mapped into PeopleSoft or if customizations to PeopleSoft are required to conform existing operations. Design changes to existing business systems to conform to PeopleSoft or customize PeopleSoft to conform to existing systems. Also responsible for datamapping, data conversion, testing and building and reviewing prototypes. Requirements: Bachelor's Degree or equivalent in Business Admin., Accounting or related field and one year of experience in Accounting, finance or other management or support position, knowledge of PeopleSoft Enterprise Resource Planning Software. Salary: $66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Sue Notarnicola, Fayette County Team PA CareerLink, 32 Iowa Street, Uniontown, PA 15401-3512, Job No. WEB105422.

Software Consulting Engineer

Responsible for design, development, and implementation of Internet/Intranet, C++ and Java applications of company's object-oriented database product suite for customers. Duties include: represent company directly at customer sites to assist in design, development and implementation of customer applications using object oriented techniques and products; provide technical assistance to customers by performing Application Design Review, Performance Tuning, Project Management, Hands-on coding, Porting Applications, Application Analysis, Benchmarks, and Installations; teach formal courses for classes of up to 20 students in object oriented Database Design, Programming, Performance Tuning, System Administration and Schema Evolution, at customer sites and or public education centers; represent customer requirements within company, serving as interface to Technical Support, Product Marketing, Engineering, QA, and Technical Sales Support. Travel to customer sites and other locations 50-80% of the time. Requires BS in Comp. Sc. or Eng'g, 3 yrs exp. in position offered or 3 yrs postgraduate professional software exp. Must include formal object-oriented analysis (OOA) and object-oriented design (OOD) methodology, deploying software for multiple platforms, and proficiency with C++ and/or Java object-oriented programming languages. 40 hours/week; sal. $80,000/year. Send resumes to Case#1992986, PO Box 8968, Boston, MA 02114.

ENGINEERING

The San Francisco office of Charles Schwab & Co., Inc. has Staff, Sr. Staff and Director career opportunities in the Schwab Information Technology Enterprise. Specific disciplines include Database Administrators, Systems Programmers, Programmer Analysts, Information Security Specialists, System Administrators, Architects, Project Managers, Systems Engineers and Network Engineers. Technical Environments: NT, UNIX (Solaris, AIX, HP-UX), MVS, CICS, CICS/6000, SNA, C, C++, COBOL, Powerbuilder, SQL, DB2, Oracle, PeopleSoft, Firewalls, Visual Basic, Java, JavaBeans, ActiveX, J++, CGI Scripting, HTML, SILK, QA Partner, CORBA, DCE, HP-Openview, NewBridge, Tivoli, Remedy, Legato, Peripherals, CTI, Parallel Sysplex, LDRPS, MQ, NetIQ, ATM, PBX, Electronic Output, Cisco, Sendmail, Imaging, Electronic Messaging, AFP. We offer the competitive salaries, excellent incentives and the comprehensive benefits of a recognized industry leader. Email your resume, indicating Job Code SK/99IC to: schwab.jobs@schwab.com Charles Schwab & Co., Inc. Member SIPC/NYSE. 0300-5070. Equal Opportunity Employer.

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PROGRAMMER/ANALYST

Analyze, study and evaluate existing legacy applications and write specifications used to convert these applications into a client-server environment. Will develop and code software applications as per client requirements and budgetary constraints. Prepare program specifications and diagrams and develop coding logic. Use tools such as charts and diagrams to assist in problem analysis and submit recommendations for solutions. Will plan projects using appropriate technical planning tools. Responsible for encoding, testing, debugging and installing operating programs and procedures in conjunction with user requirements. Experience must include: Knowledge of legacy and client-server applications, 1.5 yrs experience in COBOL, CICS, DB2, MVS, JCL and VSAM and a Bachelor Degree or equiv in Engg/CS/Science and 2 years of related experience. Fulltime position (40/wk, 8:30am-5:30pm). Salary: $49774.40/yr. Overtime: n/a. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 215 Keo Way, Des Moines, Iowa 50309-1727. Please refer to Job Order IA1101071. Employer paid advertisement.

Client/Server Technical Architect. Apply principles of software engineering to research and develop strategies for n-tier client/server design and implementation. Research and recommend products, technologies, and standards for the client/server environment. Design client/server architectural components. Define the testing approach for production fixes and performance enhancements. Identify and resolve performance issues. Develop performance benchmarks to determine application performance breakpoints. Mentor client/server architects and developers. Requirements: Master's degree in Comp. Sci., Engin., Math, or Information Systems and either five years of exp. in job offered or five years of exp. in multi-tier client server programming on UNIX platform. 40 hrs/wk, M - F, 8:00 am to 5:00 pm. Salary range: $83,000-$107,000 per year. Apply to the AR Employment Security Dept., 1223 W. 7th St., Little Rock, AR, or send two resumes to: David Hayes, P.O. Box 2981, Little Rock, AR, 72203. Ref. Job Order #008966.

Computer Sciences Corporation (CSC)

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- Computer Systems Analyst

West Virginia
- Programmer/Analyst

Travel may be required. Salary DOE. Send ad & resume to AD# 31281-7, Attn: Patty McNally, 2100 East Grand Ave., El Segundo, CA 90245. **Please indicate specific title/location of job for which you are applying on your application letter.**

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Software Engineer (multiple openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using relational data base management systems (RDBMS). Work involves extensive travel and frequent relocation. Must have 1 year of experience using 1 from Group A and 2 from Group B OR 1 from A and 1 from B and 1 from C OR 1 from A and 2 from C. A) DB2, FoxPro, Informix, Ingres, MS-Access, Oracle, Paradox, Sybase and Unify; B) AIX, DOS, HP-UX, MVS, Novell, OS/2, Sun OS, UNIX, VAX/VMS, Windows; C) 4GL, APT, C, C++, COBOL, Case Tools, C Shell, Crystal Reports, E-SQL, Easytrieve, JAVA, ODBC, PowerBuilder, PowerDesigner, Power J, Power++, S-Designer, SQL, Shell Script, Visual Basic. Bachelors degree, or foreign equivalent, in Computer Sci/Apps. Eng., Chem., Math, Physics or a scientific or business related field. Salary is $66,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Thomas C. Dembrosky, Manager, Indiana Job Center, 350 North Fourth Street, Indiana, PA 15701-2000. Job Order No. WEB 103815

Applications/System Architects: Positions available in our New York, New York City, Chicago, San Jose, San Francisco and Nashville area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will design, develop and implement enterprise wide, distributed applications in various OO, client/server, n-tier environments against various relational databases. Will utilize OO languages, including Forte and Java, and relational databases such as Informix, Oracle, Sybase, MS SQL Server, and DB2. Will lead development teams. Requirements: Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering or equivalent, plus five years of experience, which must include experience in programming with an object-oriented programming language; or Master of Science degree in Computer Science, Computer Engineering or Electrical Engineering, or equivalent. If interested, please email your resume and cover letter to: jobs@thoughtworks.com.

Project Manager: Plan and manage workload for project teams engaged in development and customization of billing systems for cellular industry. Interface with customers' senior management as technical and business issues. Manage delivery of products and services to customers. Manage project schedules and budgets. Supervise team of computer programmers and systems analysts in installation of the product on customers' sites. Design, develop and customize billing systems for cellular industry. Requirements: Bachelor's degree or foreign degree equivalent in information systems, computer science or related field plus three years of experience in offered position or in project management & supervision with billing systems for cellular industry. Stated experience must have included programming, systems analysis and/or database design. Salary: $70,000/year. 50 hrs/wk, M-F. Job Order # 6514460. Submit two resumes to: North Metro, Job Order # GA 6514460, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or the nearest Department of Labor Field Office.

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Business Analysts: Positions available in our New York, New York City, Chicago, San Jose, San Francisco and Nashville area offices. Will work as team leaders with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will apply OO analysis and design methodologies and object modeling techniques to design OO applications. Will be responsible for working with users to define system requirements. Will translate those requirements into clear and precise specifications for the developers to implements. Will design screens, write use cases, design and perform system testing. Requirements: Master's degree in Business, Computer Information Systems or related field, or equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

Software Engineer - Systems requirements analysis, application & object design, developing, testing, coding & creating software documentation in PowerBuilder, Java & PFC in Windows NT environment on Sybase Server. Must have Bachelors in engineering, computer science or MIS & experience working with PowerBuilder, PFC Java & Sybase Servers. $65,000 per/yr. May require work anywhere in the U.S. Send resume to Philadelphia Job Bank, 444 N 3rd St., 3rd Fl., Philadelphia, PA 19123. Job # 9109500

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Software Engineer: Design develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work requires extensive travel and frequent relocation. Must have of least one year of experience using BaaN. Must have a Bachelors degree in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Salary is $85,000 per/yr, 40 hrs/wk, 9:00-5:00 p.m. Please submit resumes to: Mr James J. Macken, Manager, Beaver Falls Job Center/TPCL, 2103 Ninth Avenue, Beaver Falls, PA 15010-3957, Reference Job Order No WEB 101931

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Consultant (2 positions). Design, develop & implement systems database solutions for business clients. Perform analysis, design, programming & documentation for all phases of projects. Perform feasibility studies & identify system & data processing problems. Tools: AS/400, RPG/400, CL/400, C/C++, Visual Basic. Bachelor's degree* in Comp. Sci. + 2 yrs. exp. in job offered or as Programmer/Analyst req'd. (*Will accept 3-yr degree in Math &/or Physics + 1 yr. exp. in applications development in lieu of Bachelor's degree.) Prior exp. must include: AS/400, RPG/400, C. 40 hrs/wk, 8am-5pm, $80,000/yr. Send resume to Colorado Dept. of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Ste 400, 1515 Arapahoe St., Denver, CO 80202-2117. RE: Job order #CO4660135.

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support application software using object oriented design methodologies (Booch, UML). Rational Rose, C, C++, Java, HTML, Shell, Perl, SQL, Sybase, Oracle, TCP/IP and RogueWave tools.h++ on Unix and Windows platforms. Require: Master's degree or Computer Science, Information Systems, Business Administration, or a closely related field with one year of experience in the job offered or in the related occupations of Systems/Business Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Salary $70,000 per year & AM to 5 PM, M-F. Send resume to H.R. Director, Symbiosis Software, 5106 Santa Fe Pkwy., Atlanta, GA 30350. Attn: Job PS

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Procom Tech Inc.	11.19	Sapient Corp. (L)	-11.81
Quest Software	11.00	Computer Sciences	-11.31
Manugistics Group Inc.	10.94	Symantec Corp.	-10.47
Micron Technology (H)	10.88	eBay Inc.	-9.06

Tech Services Firms' Stocks Head South

Lower revenue forecasts send share prices down

BY JULEKHA DASH

SHARE PRICES of leading computer services firms have taken a hit on Wall Street in recent weeks as a result of disappointing revenue announcements.

Last Tuesday, Computer Sciences Corp. [NYSE:CSC] in El Segundo, Calif., announced that its first-quarter revenue growth projection of 15% was being decreased to 13%, sending the stock tumbling 14%.

Two weeks ago, the share price of Perot Systems Corp. [NYSE:PER] in Dallas declined more than 20% after the firm announced that second-quarter revenue and profit would be less than it was for the same period last year.

Meanwhile, earlier this month, Electronic Data Systems Corp. [NYSE:EDS] saw a similar drop in its share price when it lowered its second-quarter revenue growth projections. The Plano, Texas-based company cited sales reorganization and contracts starting slower than expected. But analysts said the problem has more to do with the inflexibility of these major systems integrators.

"The sentiment around [the] traditional IT services space has definitely deteriorated," says Karl Keirstead, a senior analyst at Lehman Brothers Holdings Inc. in New York.

Major computer services firms aren't able to transition rapidly enough from providing traditional information technology services, such as enterprise resource planning, to emerging sectors, such as customer relationship management, electronic business and wireless applications, say analysts.

And boutique Web consultancies such as Scient Corp. [Nasdaq:SCNT] in San Francisco and Sapient [Nasdaq:SAPE] in Cambridge, Mass., are stiff competitors. "We know that these large firms don't turn on a dime. In the short run, they might lose some market share until they scale up to e-business capabilities," says Randall.

But some analysts say they expect a brighter outlook. Gary Helmig, an analyst at Wit SoundView Group Inc. [Nasdaq:WITC] in Stamford, Conn., says many of the new customers enlisted in the first and second quarters will show up in revenue statements later this fiscal year. William Loomis, an analyst at Legg Mason Wood Walker Inc. [NYSE:LM] in Baltimore, also predicts better numbers in the third and fourth quarters as larger firms spend more money on electronic-business outsourcing projects.

Gone for a Dip

Share prices before and after disappointing revenue announcements:

	BEFORE	AFTER
CSC	$82	$71
Perot	$14	$11
EDS	$57	$43

SOURCE: COMPANY ANNOUNCEMENTS

KEY: (H) = New annual high reached in period
(L) = New annual low reached in period

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How to Contact Computerworld

TELEPHONE/FAX

Main phone number (508) 879-0700
All editors unless otherwise noted below
Main fax number (508) 875-8931
24-hour news tip line (508) 820-8555

E-MAIL

Our Web address is **www.computerworld.com.** All staff members can be reached via e-mail on the Internet using the form: **firstname_lastname@computerworld.com.**

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LETTERS TO THE EDITOR

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MAIL ADDRESS

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REPRINTS/PERMISSIONS

Phone Ray Trynovich (717) 399-1900, ext. 124
E-mail rtry@rmsreprints.com

CONTACTING CW EDITORS

We invite readers to call or write with their comments and ideas. It is best to submit ideas to one of the department editors and the appropriate beat reporter.

Editor in Chief Maryfran Johnson (508) 820-8179
Editorial Director, Print/Online Patricia Keefe (508) 820-8183

DEPARTMENT EDITORS

News Editors Anne McCrory (508) 820-8205
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CONTRIBUTING COLUMNISTS

Allan E. Alter, Joe Auer, Jim Champy, John Gantz, Dan Gillmor, Peter G. W. Keen, Bill Laberis, David Moschella, Fran Quittel, Paul A. Strassmann, Don Tapscott, Ed Yourdon

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.Net Services

of software on the server and the client. It provides an environment for all kinds of client devices to access services that live oo the Web or oo enterprise servers. Microsoft said .Net will work on Windows and other operating systems, though it didn't specify which ones or wheo they would be supported.

On the server side, the upcoming Visual Studio 7 will provide tools to make applications available as services using XML and Simple Object Access Protocol. Microsoft will also offer some of these services itself.

On the client, .Net provides a sparse browserlike interface without menu bars. A key concept in the interface is the "universal canvas," which eliminates the borders between applications. For instance, spreadsheet and word processing features are available inside e-mail documents. .Net will also support handwriting and speech recognition.

"This will affect every part of application code that gets written. It affects the user interface," said Microsoft Chairman and Chief Software Architect Bill Gates. "There's no part of Microsoft that won't get touched."

Analysts were upbeat. "I haven't seen any [competing visioo] that is as all-encompassing," said Roger Kay, an analyst at International Data Corp. in Framingham, Mass.

Steve Kleynhans, an analyst at Meta Group Inc. in Caledon, Ontario, echoed that opinion. But, he said, "getting there from here is going to be very difficult."

Not There Yet

Although Versioo 1.0 of the .Net client for Windows, dubbed Windows.Net, will ship next year, the server side as well as the "complete" .Net user experience won't be ready until 2002 or after, executives said. Kleynhans said it may in fact take until 2004 to deliver on .Net.

That's a long wait in Internet time, said Mohammad Rashid, chief technology officer at Goinvest.com Inc. in Santa Monica, Calif. "We are building applications today, so we have to go with a mature standard," said Rashid, who is building an online trading system oo Enterprise Java Beans. If .Net does become prevaleot, "it should be able to talk to other object technologies. That's the promise of XML," said Rashid.

Others voiced doubts about the development model.

"I doo't think there is enough knowledge around XML and what its abilities are yet for Microsoft to be planning something like this," said Forrest Newstrom, manager of systems and programming at the Alaska USA Federal Credit Union. Newstrom said he will investigate .Net but is skeptical about it.

Deepak Amin, CEO of vJungle Ioc., an application service provider that offers an integrated environment for small businesses, said he is convinced that XML will prevail — but not oecessarily Microsoft's vision of it. Developers may be hesitant to plug Microsoft-owned services into their own Web applications. "It raises issues of privacy and of ownership of the client," said Amin. "It's certainly not a given that Microsoft will succeed."

There is also a widespread fear that, despite Microsoft's professed support for open standards, adopters will still get locked into a proprietary technology. "If they do like they have done in other areas, they will try to skew it in their own best interest," said James Harvey, vice president of technology at Visible Markets Inc. in Boston.

"A lot depends on how [Microsoft goes] about forming partnerships," said Kay, who added that he believes .Net's chances of success are "better than 50%."

Belief in Microsoft

Some said they believe Microsoft will prevail. "Microsoft is such a force, it's hard for the rest of the industry not to go in the same direction," said Bart Fitzgerald, vice president and CIO at Central Programs Inc. in Bethany, Mo.

Frank Huster, a technology manager/architect at Wells Fargo Services Co. in Concord, Calif., said he's very interested in tracking Microsoft's .Net platform, eveo though his company has made a heavy commitment to enterprise Java. "We're keeping our eye on both the Microsoft platform and the [Java 2 Enterprise Edition] platform," he said. "We doo't want to put all our eggs in one basket."

Consultant Chris Dickey of CDickey.com in San Diego said .Net will probably be a hot topic at a developer's conference Microsoft is hosting the week of July 10. "The details will probably come out," he said.

Patrick Thibodeau, Carol Sliwa ond Christine McGeever contributed to this story.

.Net and Microsoft's Antitrust Case

Many observers were speculating last week on how a possible breakup of Microsoft could affect .Net plans. Microsoft executives refused to address the issue at the .Net launch, insisting that they're proceeding without considering the possibility that they may lose their current appeal (see story, page 6).

Microsoft Chairman Bill Gates also denied that the .Net plans were in any way influenced by the antitrust trial.

But some analysts did see a connection. "Everything they demonstrated [at the .Net announcement] would end up in the applications company," said Steve Kleynhans at Meta Group. "It's interesting how they've sidestepped the whole breakup issue."

The breakup order states that every Microsoft technology that doesn't strictly belong to the operating system will become part of a post-breakup applications company – one that, unlike the operating system company, will be virtually unregulated.

.Net mainly consists of a browserlike layer on the client and of server applications such as Commerce Server and BizTalk Server.

– Dominique Deckmyn

Continued from page 1

Microsoft's C#

will simplify the building of components for the Microsoft.Net framework that can evoke Web services from applications writteo in different languages and running on different operating systems such as rival Solaris. Microsoft officials declined to say when it would ship.

"C# is a way of graphically building applications and components for Web services," said Tony Goodhew, a Microsoft product manager. "This solves the problem that customers actually have; they want interoperability between platforms, oot the same code running on all platforms."

Writing code once and being able to run it on any platform has been one of the prime promises of Java, a development language promoted by Microsoft rivals IBM and Sun.

Microsoft officials wouldn't disclose how C# fits into the .Net software infrastructure that the software company announced last week.

Some users were skeptical.

Web-based procurement outsourcer Outpurchase.com Inc. in Mountain View, Calif., began developing its applicatioo with Microsoft tools but is shifting to Java because of the cost of training developers on Microsoft's Distributed Component Object Model, said Rusty Franz, vice president of engineering.

> I cannot wait around a year for something to come out.
>
> RUSTY FRANZ, VICE PRESIDENT OF ENGINEERING, OUTPURCHASE.COM INC.

"If [C#] were here today, I would jump oo the bandwagon, but it's not even announced yet," said Franz. "It's too little, too late. If I'm going to make a techoology change, I cannot wait around a year for something to come out."

"Our desktop will stay Microsoft, but in our Web environment, we have to worry about interoperability and developing across platforms, and Java provides that," said Pat Schmid, a software engineer at Bently Nevada Corp., a machinery services company in Minden, Nev. "The problem is that there is a significant learning curve every time Microsoft comes out with a new version of something."

Idaho Power Co. is heavily invested in Microsoft techoologies but is shifting to Java for Web-based applications that ruo on both Windows NT and its mainframe, said Rob Eamon, systems architect at the Boise, Idaho-based electric company.

"We will take a look at C#, but I cannot see a compelling reason to learn another language or to move from Java and Visual Basic," he said.

Like Java, C# will include new security features and "garbage collection," which is an application's ability to free up memory allocated to run an applicatioo when the application shuts down, Microsoft officials said.

Kyle Mossman, a database administrator at Alaska Airlines in Seattle, said garbage collectioo is an important feature and needs to be improved in Microsoft's C++ language, but it isn't compelling enough for him to shift to C#.

"They already have too many development environmeots as it is," he said. "We're straight [Microsoft Internet Informatioo Server], but we don't want to dump what we're doing and jump onto another development environment."

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FRANK HAYES/FRANKLY SPEAKING

Security? Who cares?

SOME PEOPLE THINK the rules just don't apply to them. Take the nuclear scientists at Los Alamos National Laboratory, for example, who figured they didn't really need to report promptly that hard drives containing top-secret information had gone missing. Or the customer service people at America Online, who opened virus-laden e-mails and allowed hackers to grab customer data, including passwords and credit-card numbers.

Now there's a congressional investigation of Los Alamos, and internal audits are under way at AOL. And no doubt both organizations will launch campaigns to convince all their employees of the importance of security. They'll stress that the security rules do matter and that everyone must take the necessary precautions to protect their data, their networks and their organizations.

Forget it, guys. It won't work.

Employees aren't blind, and they're not stupid. They can see which priorities are really important to their co-workers and bosses and they know security isn't one of them.

And these aren't special cases. The special cases, the exceptions, are organizations like the military, where people believe — rightly — that following security rules can be a matter of life and death.

For everyone else, those rules are just a nuisance.

Want another example? Last August, former CIA director John Deutch was stripped of his security clearance because he surfed the Internet from a home PC that was also stuffed with classified information. ("At no time did I intend to violate security rules," Deutch said later. Yeah, right.) A Senate investigation concluded that the CIA knew Deutch was mishandling secrets and buried that fact for a year before reporting it to the FBI and Congress.

Put simply, the U.S.'s top spy ignored the CIA's security rules, but his co-workers kept a lid on it and even rewarded him with consulting work after he left the agency. Ironically, one of those consulting gigs — just months before his clearance was pulled — was investigating security at Los Alamos.

Outrageous? Sure. But you know the same thing would likely happen in your company if the CEO broke security rules and exposed proprietary information to crackers or industrial spies. As long as that CEO keeps delivering good business results, security screwups will be forgiven.

And you know the rest of your users are just as likely to ignore the rules and cover up lapses. They know teamwork and efficiency and, especially, the bottom line are what count with the boss — not security.

Maybe someday security will be a corporate priority.

They don't buy the lip service about security they hear from managers. They know opening all their e-mail quickly, without thinking about dangerous attachments, is the way to get the job done fast. They know that working at home from their cable-modem-equipped PCs — even if it risks exposing corporate data to hackers — is how you get a promotion, not a reprimand for compromising security.

Maybe someday security *will* be a corporate priority for your organization. That'll have to start with your CEO and top executives, and it will take years to percolate down through the rest of the business — to change your company's culture and your users' attitudes.

In the meantime, it's up to IT. So let's install the firewalls and antivirus software. Patch security holes. Monitor network traffic and server logs. And yeah, remind users — but don't expect results.

Because until security matters as much to the boss as the bottom line, most users just plain won't believe security rules matter to them.

And *that's* a rule that applies to everyone.

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

EXCEPTIONAL A pilot fish updating financial systems at a trucking company complains to the sales VP that, with so many exceptions to pricing policies, it's impossible to automate the process of estimating a job. No sweat, says the VP, who promptly issues a memo outlining strict new pricing guidelines. Which sound great to the fish, until he reads the memo's last sentence: "There will be absolutely no exceptions to this policy, except for the following:" – followed by a long list containing all but the smallest customers.

TACTICAL Southwestern electric utility hires an IT pilot fish to trim its backlog of 18- to 36-month-old user problem reports. "When I would call the user who filled out the report for clarification, I would often be told that the person no longer works for the company," says the fish. He suggests to his boss that maybe he should hire more contract support techs. "What's the point?" the boss shrugs. "If my backlog drops to much less than a year, they'll make me get rid of some of my people."

FUNCTIONAL Pilot fish waiting for a plane chats with a Fortune 500 CIO who's reading prescreened printouts of his e-mails. "I have an intelligent front end on my e-mail system," he says. "It's called Elaine."

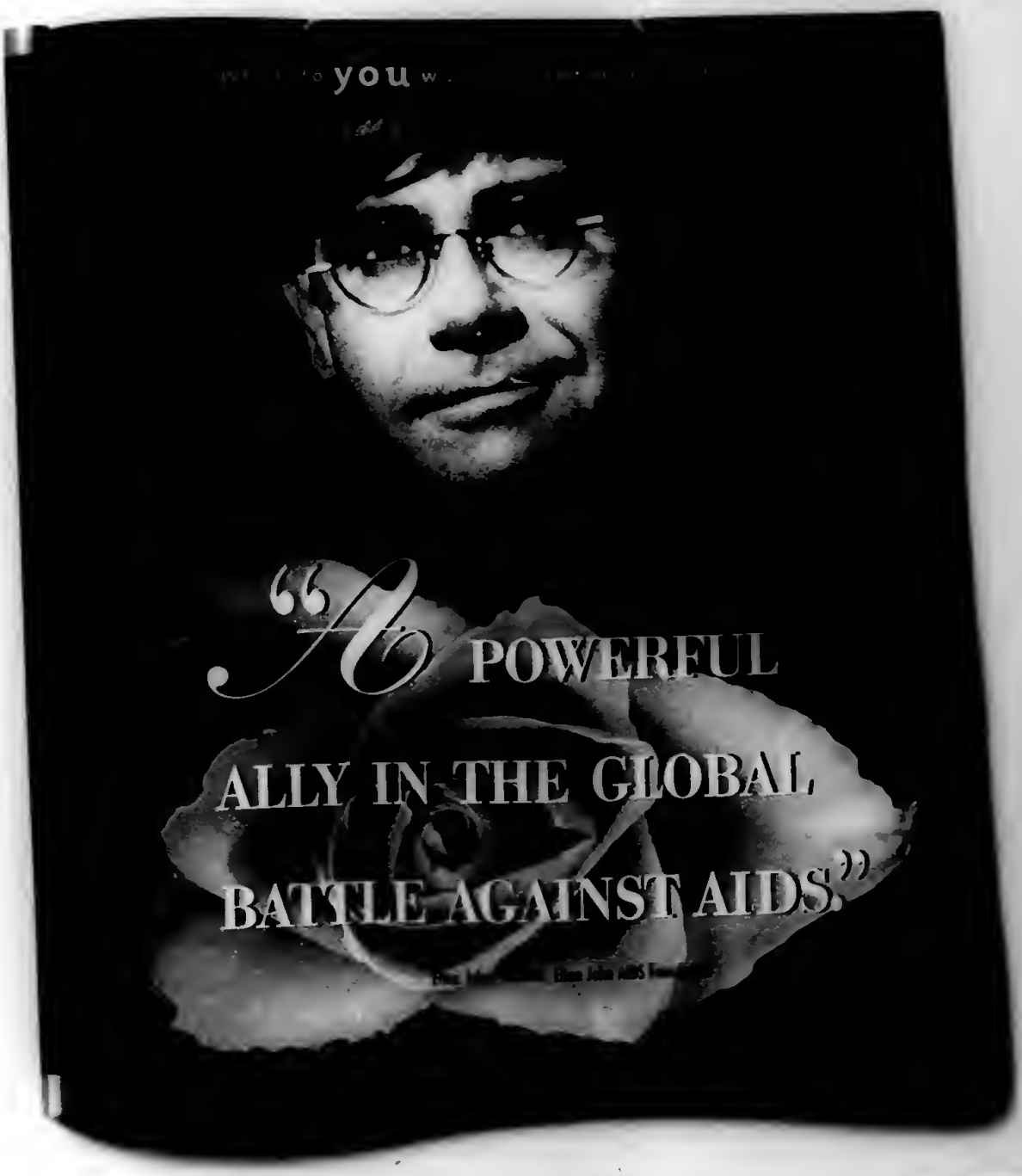
CRYPTOGRAPHICAL Ad-scanning pilot fish decodes some IT help-wanted jargon from a Big Three automaker looking for project-management support. The applicant "must be capable of operating in a team environment, providing direction and assistance using interpersonal persuasion and motivational skills without the benefit of operating from an authority position." Translation: "You'll have to manage people – but without having any power."

ECONOMICAL Security pilot fish learns some fiscal facts of life when he leaves his job at an ISP to join a new office for a fast-growing start-up consultancy that's angling for venture funding. The salary's not much, but the fish is supposed to get a healthy bonus if he bills enough hours of work. But after four months, he hasn't worked a single billable hour. He asks around; turns out *nobody* in the office has worked any billable hours. Zero billable hours divided by a bonus quota means . . .

Sharky's bonus this week will be on the grill starting Friday afternoon, and it won't be done until the fireworks are over. Send a skyrocket my way: **sharky@computerworld.com**. If it sees print, you'll get a dandy Shark shirt. And we grill 'em up daily at *computerworld.com/sharky*.

The 5th Wave

"We take network security very seriously here."



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